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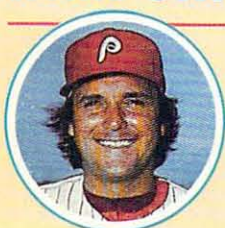
APRIL 1987

VOLUME 5
NUMBER 4

PREVIEW
NEW AMIGA 2000

FAMILY COMPUTING

**High-Powered
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for the
Home Office**



**Play Ball!
Tug McGraw
Rates Baseball
Games**

**Software That
Makes Your
Computer Talk**

**Communications
Software:
What to Buy**

**A \$100,000
Business in a
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How to Start Your Own Home Business



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AT-A-GLANCE
SOFTWARE
REVIEWS





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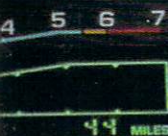
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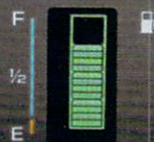
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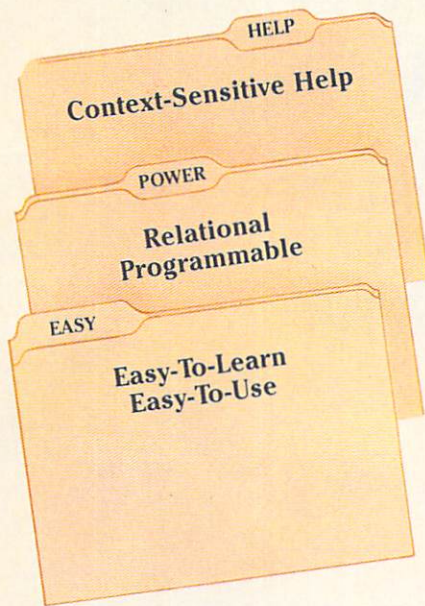


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FAMILY COMPUTING

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COVER ILLUSTRATION BY GEORGE BOOTH

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EDITOR'S NOTE

"WE HAVE SEEN THE BOSS, AND THEY IS US"

According to Link Resources Corporation, a major technology-related research organization, 43 percent of all personal computer owners are using their computers to do work at home, be it to run a business or to restructure work on the job. In either case, it means that in nearly six and a half million U.S. households, the computer is making it easier for its owners to take charge. To paraphrase Walt Kelly's Pogo, "We have seen the boss, and they is us."

The entrenchment in the home of the computer workhorse is reflected among FAMILY COMPUTING's readers as well. According to a reader survey conducted by Simmons Market Research Bureau, 49 percent of our readers operate a home office, 60 percent to run a home business, and 40 percent to do job-related work at home.

For those who own a computer, dreams of independence are more readily attainable. Want to be home for dinner with the family? With a computer of your own, you can work on that report after the kids go to bed. Want to stay home? With a computer of your own and a service to market, millions find they can.

When it comes to setting up a home business, the questions many of us have are, "How do I start?" and "What do I need?" To give our readers the best answers to those questions, we turned to two pros: Business consultant Michael Thomsett presents three case studies of home-based entrepreneurs and sets down steps to take when going out on your own in "Starting Your Own Home Business" (page 29); and writer Dan Gutman tracks down the new equipment designed to bring the power of big business to the home office in our "Buyer's Guide to Home Office Products" (page 34).

With half our readers operating a home office, of course we'll continue



It's "high fives" for Met vet and former Phillie, Tug McGraw, and Editor Claudia Cohl.

to cover the topic. Watch for both our regular Home Office department (in this issue contributing editor Robin Raskin chronicles how Jane Hamre set up a \$100,000 typesetting business in her basement) and feature articles, like Thomsett's and Gutman's, described above. You might want to tell us about your home-based work or business activities. Or, let us know how we can help with more information.

A new kind of game article is running this month. The proliferation of sports software on the market, directed mostly to adult players, is bound to catch your eye. So we decided to get ready for opening day by testing the baseball entries with a pro. Former Mets and Phillies pitching star and World Series veteran Tug McGraw spent a day at our office playing baseball at the console with a gawking bunch of out-of-shape fans. Tug's verdict of this armchair baseball can be found on page 42.

As always, computers at home get an all-around workout. Running a business, game-playing, learning—both school subjects and new skills—all take place at home. And you'll continue to find the full spectrum in FAMILY COMPUTING.

CLAUDIA COHL
EDITOR-IN-CHIEF

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Sometimes it's best to take a pass.

and slow dribblers. Team players and show-offs. There's guys who can shoot the eye out of a needle at 20 feet. And guys who couldn't sink

TASTE THE THRILL OF VICTORY AND THE AGONY OF THE STREET.

one if they were sitting on the backboard. Pass on the run. Get that big man on the inside.

Let Joey pop 'em from the corners. This is real street strategy. Take a hook shot. A tip-in. Bounce the ball off the chain-link fence, then go for the basket. Or power through a slam dunk.

But don't dribble in the oil slick. And for heavens sake, watch out for windows.

It's not like any basketball game you've ever played on a computer. But just like every basketball game you've ever played for real.

ANOTHER HIT.

It's bottom of the ninth. Batter's 0 and 2. The score—well, maybe it's time to take up bridge.

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But it's right up your alley.

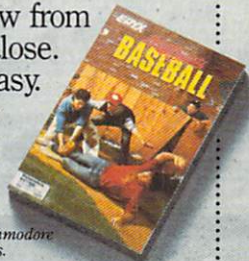
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CIRCLE READER SERVICE 17



Notice that somebody just stole second base. Funny it was here a minute ago.



HOME-SCHOOL CONNECTION

A FAMILY THAT LEARNS TOGETHER

The Homzas, Grand-Prize Winners of a FAMILY COMPUTING Essay Contest, Told Us How They Use a Computer for Learning and Won an Apple IIGS!

BY KAREN KANE

For years, Nancy Homza of Danville, Illinois, used a calculator and pencils to organize the books for her father's farm. When her father purchased an IBM PC two years ago, she quickly discovered that the computer could painlessly organize her dad's complex records in a snap. Nancy also realized that if she put a compatible computer in her own home, even more time would be saved because she could pare down the number of trips she makes to her father's place across town. So last February, Nancy bought an IBM PC Portable. At the time, she had no idea that her new number-crunching and storing machine would become a marvelous educational tool for the entire family.

FROM LEDGERS TO LEARNING

It didn't take long, however, for Nancy, her husband, Bill, and their four daughters to find dozens of educational uses for their new computer. In fact, Nancy estimates that 95 percent of her family's computing time is spent on educational applications.

The oldest daughter, Beth, a 20-year-old sophomore at Parkman College in Champaign, Illinois, relies heavily on the family's computer to complete school assignments. As a psychology major, Beth must write countless essays, book reports, lab reports, and term papers. Beth has been known to travel the 30 miles from college to boot up the family's word processor, *Writing Assistant* (IBM), when she has a tight deadline to meet. Beth says that even when considering the travel time—writing with a word processor is faster than a typewriter, giving her more time to study and pursue other interests.

Marianne, 19, who currently at-



tends the Danville Area Community College, is brushing up on her business skills in preparation for a secretarial job. She boots up *Letter Getter* (from the May 1986 issue of FAMILY COMPUTING) and *MasterType* (Scarborough Systems) to increase her typing speed and accuracy.

The computer is also helping Marianne find a job. She stores an up-to-date resume on a disk, keeps track of the names and addresses of personnel directors who interview her, and writes follow-up letters.

Seventeen-year-old Linda is a junior at Danville High School. She admits that high school was a scary place at first, and during the first few weeks of classes, she used her family's computer to keep track of her overwhelming schedule. Using *PFS: File* (Software Publishing Corp.), she printed out copies of where she should be on a given day and designed a personal calendar to remind her of homework assignments and special projects. Linda is expanding her knowledge of computers by taking a class in BASIC and has volunteered as a computer helper during study hall to get extra time on the Apple computers at school.

KEEPING UP TO PACE WITH PEERS

But 13-year-old Debbie, who is deaf, is the family member who

benefits most from the computer.

One of the biggest handicaps Debbie had to overcome was a deficient vocabulary. Since she can't hear words, she must rely on visual recognition and memory to learn new words and their definitions. This task is so difficult that children who are deaf are often years behind their peers in language development. Debbie has improved her vocabulary dramatically using her family's computer. By typing out vocabulary words on the computer with their corresponding definitions, Debbie creates a matching game to memorize the words with their definitions and spellings. "The computer never laughs at Debbie's mistakes but instead makes her laugh at the mistakes while she is correcting them," says her mother, Nancy.

Since Debbie also has some trouble with spelling, she uses the spelling dictionary in *Writing Assistant* to check sentences for misspelled words. She compiles a list of the words she frequently misspells and includes them in word games such as *Word Search* (from the September 1986 issue of FAMILY COMPUTING) to reinforce her learning. This practice has greatly increased her vocabulary, and partly as a result of her successes with the family's computer, Debbie attends a regular eighth-grade class at Northridge Middle School in Danville. Debbie loves to write original stories and illustrates them with *The Print Shop* (Broderbund) and *PrintMaster* (Unison World). Her teachers are enthusiastic about her work and report that her language is comparable to that of a child who hears.

It's also important for Debbie to practice her typing skills so that she can use her Telephone Device for the Deaf (TDD). The device is set up so that typed messages can be transmitted from one TDD to another over the telephone lines and viewed

KAREN KANE is FAMILY COMPUTING's technical associate.

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HOME-SCHOOL CONNECTION

THE WINNERS

In FAMILY COMPUTING's most recent "Parents Guide to Learning at Home with Computers" (October 1986), we asked our readers to write short essays telling us how they use their computers as educational tools. We promised to award an Apple IIgs—including keyboard, mouse, disk drive, and RGB monitor—to the computing family who best demonstrates a dedication to learning in inventive and rewarding ways. After reading more than 1,000 entries, the FAMILY COMPUTING editors chose one grand-prize winner and ten runners-up. (The runners-up each won \$100 worth of educational software.) Here are the 11 winners:

GRAND-PRIZE WINNERS

The HOMZA family of Danville, Illinois

RUNNERS-UP

The FETTER family of Gilbertville, Iowa; the GABLE family of Mt. Carroll, Illinois; the GELZER family of Oak Bluffs, Massachusetts; the GORDON family of Mobile, Alabama; the HADERLIE family of Columbus, Ohio; the MORKY family of Taylor, Texas; the MONTANO family of Milpitas, California; the SIMKINS family of Enterprise, Utah; the WAGNER family of Cicero, Illinois; the WEBB family of West Hartford, Connecticut.

RUNNER-UP: THE SIMKINS

Rescuing her father's Radio Shack TRS-80 was one of the smartest things Kathy Simkins of Enterprise, Utah, ever did for her sons, Regan, 12, and Rhett, 11. It has opened new doors for both Rhett, a dyslexic who was mistakenly labeled mentally retarded, and Regan, an over-achiever who was not being challenged at his school.

One of Kathy's immediate concerns was to teach Rhett as much as he was capable of learning. To her surprise, when Rhett was introduced to the computer, he caught on quickly, even mastering the same multiplication facts that, on paper, had caused him so much anguish. "I would sit him down with the Radio Shack and he would just light up," she said.

Kathy recalls how Rhett's confidence soared after working on the computer. "He went from 'I can't do this. I'm stupid' to 'I'm smart' . . . and now you have to beat him up to get him away from the computer," she said.

And when Rhett is away from the computer, Regan uses it to write stories and computer programs. "He is intrigued by that," his mom said. When he finds the spare time, "he loves to play backgammon," said Kathy. —S.E.

The following companies helped furnish prizes for this contest: Apple Computer, Broderbund Software, Davidson & Associates, The Learning Company, Mindscape, Scholastic Software, and Springboard Software.

on a small screen. To improve her typing skills, Debbie, like her sister, boots up *MasterType*.

MOM AND DAD JOIN THE ACT

When the rest of the family isn't vying for computer time, Nancy sneaks in some work for her father's farm. And she's found her own educational uses for the family computer. Nancy works as an interpreter in preschool through fifth-grade classes at a local school for deaf children.

"One of the most important skills for a very young deaf child is the development of sign language and learning to use a sign for identifying various objects," says Nancy. "Computer graphics make it easy to design flash cards for the children to practice on. Then, as the children learn to match the written words to the picture, additional flash cards can be made." *The Print Shop* and *PrintMaster* are perfect for creating flash cards for the younger students.

Nancy also tries to familiarize parents of other deaf children and the local farmers' wives with computers.

She says parents are often intimidated by computers and assures them that computing is "very simple once you get into it."

Even Bill has caught computing fever. "Bill is a little bit afraid of mechanical things," says Nancy. "In fact, he was the last to learn how to use the household blender. But he found a specific need for the computer and has really gotten into it." Bill has catalogued all of his VCR tapes with *PFS: File*. When someone in the family needs material to reinforce a unit being taught in school, "you can bet he has a tape on the topic or event listed on his computerized data base," says Nancy.

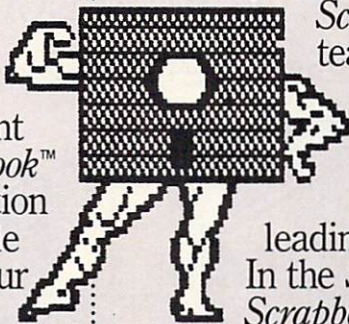
While each one of the Homzas has a different need for the computer, the family also enjoys working on the computer together. Everyone gets involved when Bill types in a new BASIC program or one of the girls tries out a new geography game, math puzzle, or word-processing trick. The computing that takes place in the Homza household is always an educational experience and it's always a family affair. ☐

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CIRCLE READER SERVICE 18



HOME OFFICE

HER TYPE OF BUSINESS

How One Homemaker Set Up a \$100,000-a-Year Typesetting Service in Her Basement **BY ROBIN RASKIN**

In a typical basement in a typical home in Blaine, Minnesota, Jane Hamre operates an atypical computer-based typesetting service. Each day, Jane, a mother of two, returns home from her job as company president of a subterranean typesetting shop by walking up the stairs from her cellar. Her home business evolved over five years of trial and error, and it has paid off handsomely. Hamre's company, J-COMP Graphics, grossed more than \$100,000 last year.

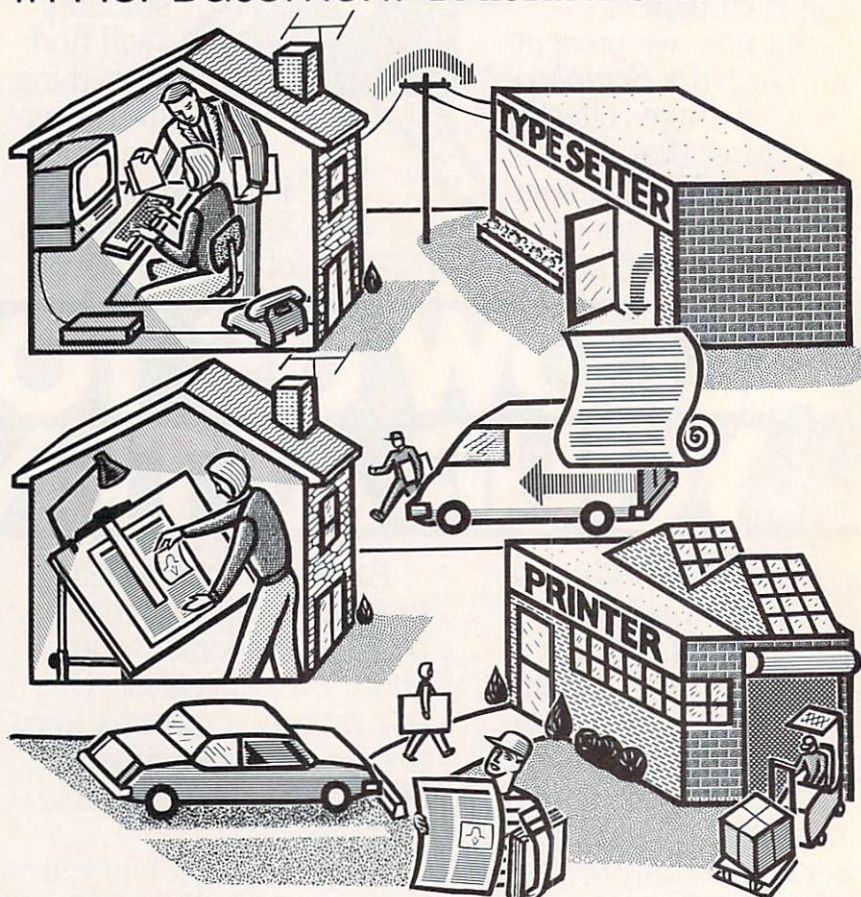
WHAT IS TYPESETTING?

Typesetting machines render the highest quality output of the printed word. Typeset text, unlike text from a typewriter or even a laser printer, looks as sharp as what you're reading now. Someone called a typesetter, keyboardeer, or composer usually enters text using a keyboard much like a typist types words with a typewriter. The typesetter also types in computer commands that tell the machine how to organize and print the letters, words, and lines. These special codes are used to tell the typesetting machine such things as the size and intensity of the letters used (such as bold, book, and light) and the font style of the text (e.g., Roman, Gothic).

Since typesetting machines cost about \$60,000 to \$80,000, only established typesetters and printers can own them. Until modems came along, the keyboardeer had to sit at a terminal near the typesetting machine and key in coded text. But today, the time-consuming task of entering text and code can be done remotely. Using a telecommunications procedure called teletypesetting, the machines can accept their commands electronically from a personal computer using a modem, a telephone line, and communications software.

TYPESET BY COMPUTER

J-COMP's clients bring their



words to Jane stored on everything from floppy disks to paper napkins. Using *WordStar Professional* (Micropro International), Jane enters her client's text into her computer, adding typesetting control codes as she proceeds. Jane's instructions, or format codes, appear in brackets that can be interpreted by the typesetting machine. Codes, preceding a line or lines of text, look like this:

<OL24> - This establishes a line length (24 picas or about 4 inches).
<CC24,1,FY240> - This sets line length and typeface.

Similarly, Jane can specify left and right margins, type size, and many other characteristics desired for the final typeset copy. And she knows her codes like a chemist knows the periodic table. So as she types, she rapidly intermingles text and codes.

Each word-processed file, when complete, is transmitted to a type-

setting shop—which has typesetting machines—from J-COMP's computer. Jane uses a Hayes modem and an IBM telecommunications program called *Connect*. Even though Jane sends her information at just 300 baud, she can usually transmit a day's work in 20 to 30 minutes.

GET READY, GET SET, TYPESET

It was Jane's husband, David, who introduced and nurtured the home typesetting idea. His former employer regularly used a local Minneapolis typesetting service. And it was this service, Cold Type Setters, that told David he would save money if he could find someone to typeset the material he needed and send it via computer and modem. David immediately thought of his wife, who was then a homemaker about to give birth to their second child. She had previously worked as a secretary at a

ROBIN RASKIN is a contributing editor for FAMILY COMPUTING.

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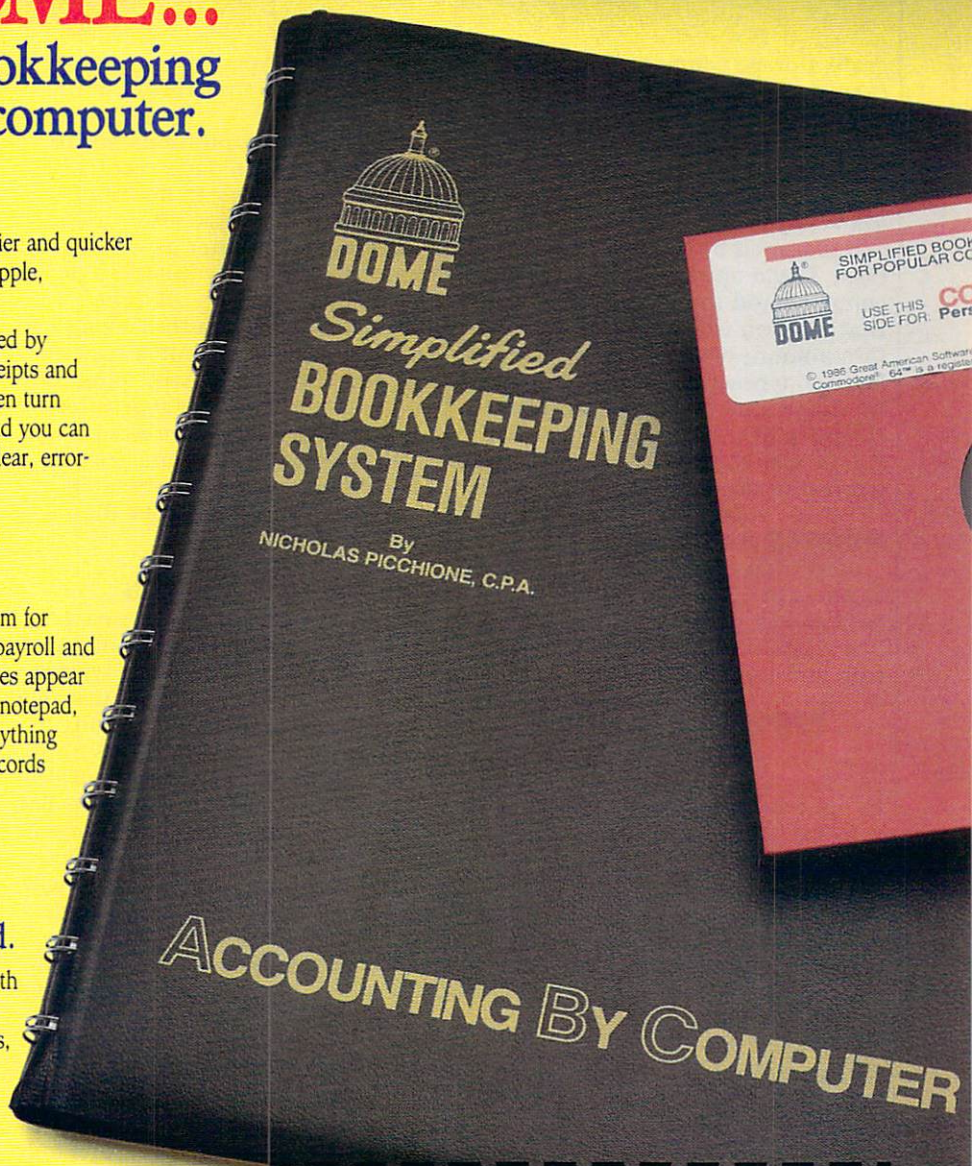
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CIRCLE READER SERVICE 20

HOME OFFICE

grain storage company and had earned special praise for her help with brochures and lobbying materials; however, she had no computer experience. "I told him he was crazy," recalls Jane, adding, "I didn't know anything about computers."

Undaunted by his wife's skepticism, David approached his own company and then assured his wife that his firm would guarantee a certain amount of work if she agreed to learn to typeset by modem. With this incentive, and only three weeks after the birth of their second child, Jane Hamre visited Cold Type Setters and learned her trade-to-be.

HUMBLE BEGINNINGS

Jane didn't try to learn everything at once. In 1981, she began with a system leased from the typesetter. The machine was a "dumb" typesetting terminal that could communi-

cate with the typesetting machine but had no real intelligence of its own.

Realizing the limitations of this simplistic system, Jane eventually invested her money in an IBM PC-compatible and, soon after, invested in a second computer as well. At about this time, her business picked up from part time to full time through word-of-mouth. Having two computers gave J-COMP a backup if one machine was "down," plus the ability to employ other typesetters. And since her kids were older and ready for computers, Jane further appreciated having the versatile power of computers rather than a system-specific terminal.

JANE-OF-ALL-TRADES

For many clients, Jane runs a pickup-and-delivery service and simply hands over the pages of typeset copy. For others, she continues as a full-service typesetter by offering a series of nonautomated tasks to prepare camera-ready copy for a professional printer. This process is called paste-up, the exacting procedure of cutting up printed text, carefully and artfully laying it out, along with any desired graphics, on a board, and then pasting it all together in page-sized chunks. The finely pasted-up result goes to any commercial printer for photographic reproduction. (Several computer software packages for desktop publishing are now able to handle on-screen page composition and paste-up).

And if a customer asks, Jane may also handle the design of, let's say, a brochure or act as a liaison with a printer. "I do whatever my customer wants, but I know my limits," confides Jane. "When I have a job that requires a certain level of design expertise, such as a menu for a restaurant, I use professional designers. Over time, I've built up a personal network of contacts."

If you think learning about the typesetting business sounds easy, it's not. Jane worked energetically to learn all phases of typesetting by computer. "I was so ignorant it was unreal," remembers Jane, "but I kept asking questions and Cold Type Setters, the company I work with, was extremely cooperative." Jane took a class at a local vocational school in order to learn to line up typeset copy correctly on a board, using a t-square, knife, and other paste-up tools.

Today, J-COMP also employs a part-time person to pick up copy from the typesetting service and deliver camera-ready paste-ups to printers and to handle bookkeeping. And Jane's husband plans to join J-COMP part time in order to handle sales for J-COMP. "I was working 12 hours a day, five days a week," sighs Jane, "so the help is appreciated."

A COZY HOME INDUSTRY

Jane appreciates being able to be home when her girls are sick or simply being available when one of them forgets her lunch. The 8- and 5-year-old girls are growing up with computers at school and at home. "They have no fear of computers," says Jane admiringly. "Both of them can type, believe it or not." And they often share Jane's office as they use the second computer or the recently acquired Macintosh, which Jane bought to explore the possibilities of desktop publishing.

Because Jane's business primarily involves just one room in her basement and an IBM PC, she keeps her costs low. These controlled costs translate to low prices for her users. Conventional typesetters with equipment that can cost as much as a house must charge more for their services. According to Jane, her fees are about half of what a large typesetting shop charges. In addition to the price of buying and maintaining typesetting equipment and supplies, rents and other business expenses are much higher at an average print shop than they are at J-COMP. Meanwhile, Jane can relax during a slow month or she can take a vacation without worrying about overhead. She only has expenses—basically the typesetting service fees and local phone bills for telecommunications—when she works.

Along with keeping J-COMP at a manageable level, Jane benefitted from having the patience to stick out the first few years of learning. "People see how busy I am and how much I'm doing, but they forget it took me five years to get here." During those five years, Jane advanced from someone with typing skills to the operator of a high-tech business, based on knowledge of the typesetting trade and the computer. And her home office has enabled her to enjoy her other roles as well. She's exactly where she wants to be, upstairs and downstairs, in Blaine, Minnesota. ☐

TIPS FROM JANE

Jane's story is unique because she had an interested first client and an interested typesetter before she began. If you want to explore typesetting via computer, you might begin by contacting local typesetting shops to see if they can accommodate you.

1. Don't expect overnight success. It takes about five years to get your business where you want it. Establishing contacts and a strong reputation takes time. Don't give up too soon.

2. Keep expenses low. Because her business is in her home, Jane keeps expenses down to a minimum. She sends her text to someone else's expensive and finicky typesetting machine, saving her money and aggravation. Her low costs are passed along to the customer.

3. Start small. Jane began with a rented system and migrated to her own when she was sure of what she needed.

4. People need to hear "can do." No one wants to hear about what a tough job you have. Just roll with the punches and keep learning. Jane is willing to attend to the detailed demands of typesetting and she is ever-ready to learn.

5. Don't overextend. J-COMP doesn't advertise; Jane prefers word-of-mouth referrals and jobs from print shops, which minimize public access to her home. Clients have asked Jane to maintain mailing lists of their customers for them but she refused; Jane chooses to keep her time focused on typesetting.

Even though Jane knows that "with the volume of business I'm doing now, I could afford my own equipment," she prefers not to be tied to monthly costs and the maintenance of a typesetting machine on her premises.

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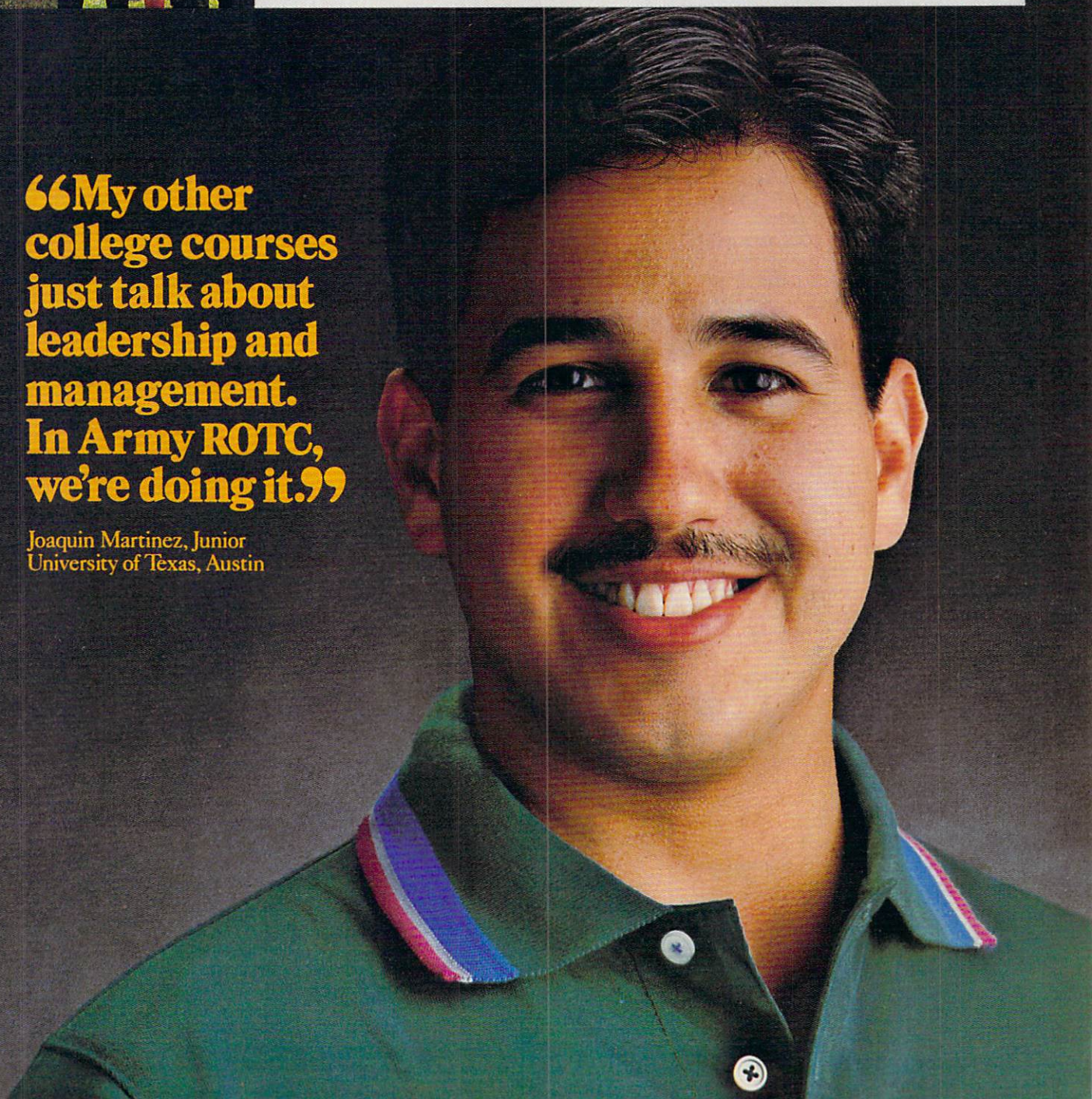
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Joaquin Martinez, Junior
University of Texas, Austin



PERSONAL FINANCE

HOW MUCH, FOR HOW LONG?

Use This BASIC Program to Figure What an Annuity Will Pay Back

BY NICK SULLIVAN
PROGRAM BY
STEVEN C.M. CHEN

How would you like to be paid \$1,000 a month—at some future date? An annuity, set up through a life insurance or financial services company, will do that—providing supplementary income to help pay for your children's college costs, retirement, or other future expenses.

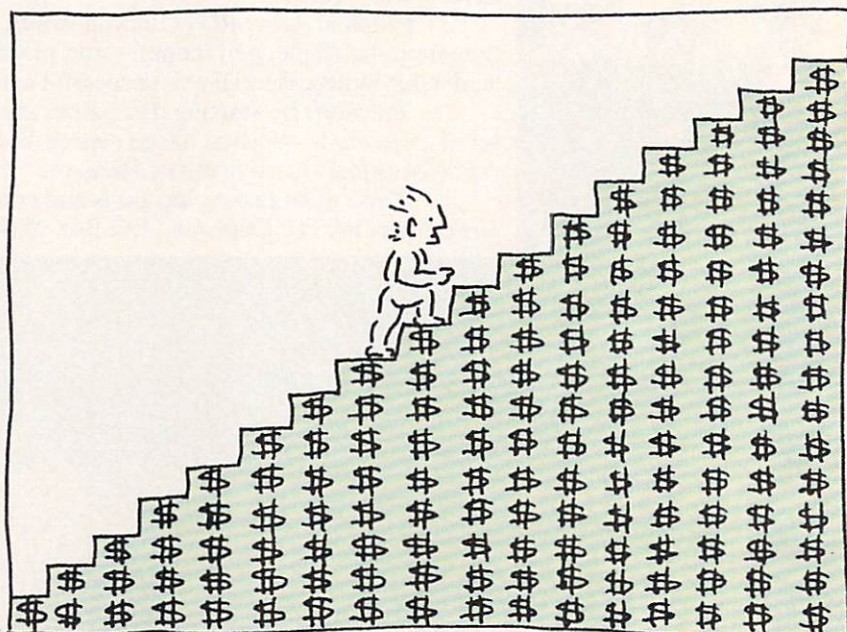
Of course, it's not quite as simple as winning the lottery, which might pay you \$50,000 a year for 20 years. You have to build up an annuity, which can be done in a variety of ways. You can invest a certain amount now (say \$5,000) and let it compound interest for 20 years. Or, you can pay premiums periodically and build up the amount more rapidly.

When contemplating an annuity, you can approach it in two ways. First, if you build up a certain amount—say, \$20,000—how long will you be able to draw payments of a certain amount? Second, if you want to draw a certain amount for a specific number of years—say \$1,000 for 12 years—how much money do you have to invest?

Our short and simple BASIC program—written for the Apple II and Macintosh, Commodore 64/128, IBM PCs, and Tandy Models III/4 computers—can answer both of these questions. Here's how it works:

Type in, SAVE, and RUN the program. It will ask you, WHAT IS THE VALUE OF THE ANNUITY? This refers to the amount of the annuity one time period (a month or year, say) before you begin to draw on it. If, for example, you plan to begin drawing an annual payment in April 1988, enter the value of the annuity as of April 1987. You can enter an amount (without the \$ or comma, e.g., \$100,000 is 100000), or ignore this question by pressing RETURN or ENTER.

Next, the program will ask, FOR



HOW MANY YEARS WILL PAYMENTS BE MADE? Keep in mind that the answer is closely tied to the next two questions: HOW MANY PAYMENTS WILL BE MADE EACH YEAR? and HOW MUCH WILL EACH PAYMENT BE?

Finally, you're asked, WHAT IS THE ANNUAL INTEREST RATE? In most cases the rate will be fixed, but some of the newer plans have variable rates. (The program makes the assumption that compounding recurs at the same intervals that payments are made.) (Enter your answer without the "%" sign, e.g., 10 for 10 percent.)

Indeed, once an annuity has been established at a certain level, it works like a savings account, gaining compound interest. The difference is that the new interest is not reinvested in the account; it's paid out to you, along with some of the principal.

THE \$64,000 ANSWER

Having asked you its questions, the program will give you answers. If you gave an amount for the value of the annuity, the program will say, THERE WILL BE XX PAYMENTS OF \$XXX.

If you took the Fifth Amendment on the first question and pressed RETURN, the program will say, YOU NEED AN ANNUITY WORTH \$XXXXX.

A HIDDEN BENEFIT

The situation presented here, of course, is unrealistic. In the real world, you may pay taxes on money earned, which effectively lowers the interest rate. In the real world, you may pay account maintenance fees, which also lowers the rate of return. Early withdrawals may incur penalties and would obviously complicate the simple model shown here. And, inflation, deflation, hyper-inflation, and other related diseases are ignored completely (in the hope that they go away).

On the other hand, annuities may be entering a golden era, according to Robert Metz, a syndicated columnist who covers the money markets. The Tax Reform Act of 1986 takes the roof off many tax shelters, but one that is still intact is the flexible-premium variable annuities offered by life insurance companies. You pay into the account whatever you choose, given certain minimums, and whenever you choose. These flexible-premium annuities operate much like mutual funds, so that their performance depends on how well the money is managed. But once you pay into the account, you can switch in and out of various investment options (stocks, bonds, etc.), and the earnings are not taxed.

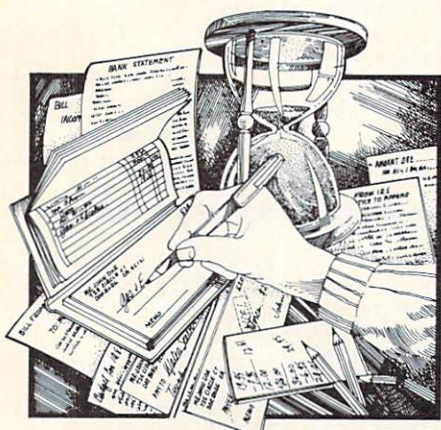
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CRITICS HAIL A BREAKTHROUGH



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Apple® IIGs, IIC and IIE (IIE requires extended 80-column card), with one or two floppy disk drives, or UniDisk™ 3.5. Any printer. No modem required. AppleWorks optional.

Product names are trademarks of their respective manufacturers.

*Patent Pending **Lotus Transfer Utility available for \$15 from Intuit

From
Intuit

Apple II series/Annuities

```

10 HOME:PRINT TAB(12);"ORDINARY ANNUITY":PRINT
20 INPUT "WHAT IS THE VALUE OF THE ANNUITY? ";TS:PRINT
30 PV = VAL(TS):IF TS = "" THEN SE = 2:GOTO 50
40 ON (PV < 1) GOTO 20:SE = 1
50 INPUT "FOR HOW MANY YEARS WILL PAYMENTS BE MADE? ";
TS:PRINT
60 YR = VAL(TS):IF YR < 1 OR YR <> INT(YR) THEN 50
70 PRINT "HOW MANY PAYMENTS WILL BE MADE EACH"
80 INPUT "YEAR? ";TS:PRINT
90 N = VAL(TS):IF N < 1 OR INT(N) <> N THEN 70
100 IF SE = 1 THEN 140
110 INPUT "HOW MUCH WILL EACH PAYMENT BE? ";TS
120 PRINT:IF TS = "" THEN 110
130 PMT = VAL(TS):IF PMT < 1 THEN 110
140 INPUT "WHAT IS THE ANNUAL INTEREST RATE (%)? ";TS
150 PRINT:R = VAL(TS):IF R <= 0 THEN 140
160 R = (R/100)/N:RR=1:T=1+R
170 FOR L = 1 TO N*YR:RR=RR*T:NEXT L
180 PRINT:IF SE = 2 THEN 210
190 PRINT "THERE WILL BE ";N*YR;" PAYMENTS OF ";
200 PMT = PV*R*RR/(RR-1):T = PMT:GOTO 230
210 PRINT "YOU NEED AN ANNUITY WORTH ";
220 PV = PMT*(RR-1)/(R*RR):T = PV
230 IF T > 999999 THEN TS = STR$(T):GOTO 260
240 IR = INT(T):FR = T-IR:FR = INT(FR*100+0.5)/100
250 T = IR+FR+0.001:TS = STR$(T)
260 TS = MID$(TS,1,LEN(TS)-1)
270 PRINT "$";TS;".":END

```

Commodore 64 & 128/Annuities

```

10 PRINT CHR$(147);TAB(11);"ORDINARY ANNUITY":PRINT
20 INPUT "WHAT IS THE VALUE OF THE ANNUITY? ";TS:PRINT
30 PV=VAL(TS):IF TS="" THEN SE=2:GOTO 50
40 ON -(PV<1) GOTO 20:SE=1:TS=""
50 INPUT "FOR HOW MANY YEARS WILL PAYMENTS BE MADE? ";TS
60 PRINT:YR=VAL(TS):TS=""
70 IF YR<1 OR YR<>INT(YR) THEN 50
80 PRINT "HOW MANY PAYMENTS WILL BE MADE EACH"
90 INPUT "YEAR? ";TS:PRINT
100 N=VAL(TS):TS="":IF N<1 OR INT(N)<>N THEN 80
110 IF SE=1 THEN 150
120 INPUT "HOW MUCH WILL EACH PAYMENT BE? ";TS
130 PRINT:IF TS="" THEN 120
140 PMT=VAL(TS):TS="":IF PMT<1 THEN 120
150 INPUT "WHAT IS THE ANNUAL INTEREST RATE (%)? ";TS
160 PRINT:R=VAL(TS):IF R<=0 THEN 150
170 R=(R/100)/N:RR=1:T=1+R
180 FOR L=1 TO N*YR:RR=RR*T:NEXT L
190 PRINT:IF SE=2 THEN 220
200 PRINT "THERE WILL BE ";N*YR;"PAYMENTS OF ";
210 PMT=PV*R*RR/(RR-1):T=PMT:GOTO 240
220 PRINT "YOU NEED AN ANNUITY WORTH ";
230 PV=PMT*(RR-1)/(R*RR):T=PV
240 IF T>999999 THEN TS=MID$(STR$(T),2):GOTO 270
250 IR=INT(T):FR=T-IR:FR=INT(FR*100+0.5)/100
260 T=IR+FR+0.001:TS=STR$(T):TS=MID$(TS,2,LEN(TS)-2)
270 PRINT "$";TS;".":END

```

IBM PC & compatibles/Annuities

This program has been tested and found to work on the following computers and hardware configurations using the BASICS shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome Printer Card. w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```

10 DEFDBL P,R,T:KEY OFF:CLS
20 PRINT TAB(12);"ORDINARY ANNUITY":PRINT
30 INPUT "What is the value of the annuity? ";TS:PRINT
40 PV=VAL(TS):IF TS="" THEN SE=2:GOTO 60
50 IF PV<1 THEN 30 ELSE SE=1
60 INPUT "For how many years will payments be made? ";TS
70 PRINT:YR=VAL(TS):IF YR<1 OR YR<>INT(YR) THEN 60
80 PRINT "How many payments will be made each"
90 INPUT "year? ";TS:PRINT
100 N=VAL(TS):IF N<1 OR INT(N)<>N THEN 80

```

```

110 IF SE=1 THEN 150
120 INPUT "How much will each payment be? ";TS
130 PRINT:IF TS="" THEN 120
140 PMT=VAL(TS):IF PMT<1 THEN 120
150 INPUT "What is the annual interest rate (%)? ";TS
160 PRINT:R=VAL(TS):IF R<=0 THEN 150
170 R=(R/100)/N:RR=1:T=1+R
180 FOR L=1 TO N*YR:RR=RR*T:NEXT L
190 PRINT:IF SE=2 THEN 220
200 PRINT "There will be ";N*YR;"payments of ";
210 PMT=PV*R*RR/(RR-1):T=PMT:GOTO 240
220 PRINT "You need an annuity worth ";
230 PV=PMT*(RR-1)/(R*RR):T=PV
240 F=LEN(STR$(INT(T+.005)))-1
250 PRINT USING "$"+STRING$(F,35)+".##";T;
260 PRINT ".":PRINT
270 KEY ON:END

```

Macintosh w/Microsoft BASIC 2.0 or 2.1/Annuities

```

10 DEFDBL P,R,T:CLS
20 WINDOW 1,"ORDINARY ANNUITY", (0,38)-(527,338):PRINT
30 INPUT "What is the value of the annuity? ";TS:PRINT
40 PV=VAL(TS):IF TS="" THEN 60
50 IF PV<1 THEN 30 ELSE SE=1
60 INPUT "For how many years will payment be made? ";TS
70 PRINT:YR=VAL(TS):IF YR<1 OR YR<>INT(YR) THEN 60
80 INPUT "How many payments will be made each year? ";TS
90 PRINT:N=VAL(TS):IF N<1 OR INT(N)<>N THEN 80
100 IF SE=1 THEN 140 ELSE SE=2
110 INPUT "How much will each payment be? ";TS
120 PRINT:IF TS="" THEN 110
130 PMT=VAL(TS):IF PMT<1 THEN 110
140 INPUT "What is the annual interest rate (%)? ";TS
150 PRINT:R=VAL(TS):IF R<=0 THEN 140
160 R=(R/100)/N:RR=1:T=1+R
170 FOR L=1 TO N*YR:RR=RR*T:NEXT L
180 PRINT:IF SE=2 THEN 210
190 PRINT "There will be ";N*YR;"payments of ";
200 PMT=PV*R*RR/(RR-1):T=PMT:GOTO 230
210 PRINT "You need an annuity worth ";
220 PV=PMT*(RR-1)/(R*RR):T=PV
230 F=LEN(STR$(INT(T+.005)))-1
240 PRINT USING "$"+STRING$(F,35)+".##";T;
250 PRINT ".":PRINT
260 PRINT:PRINT "Press <SPACE BAR> to quit."
270 IF INKEY$<>CHR$(32) THEN 270 ELSE END

```

Tandy Model III & 4 (Model III mode)/Annuities

```

10 CLEAR 200:DEFDBL P,R,T:CLS
20 PRINT TAB(13);"ORDINARY ANNUITY":PRINT
30 INPUT "What is the value of the annuity? ";TS
40 PRINT:PV=VAL(TS):IF TS="" THEN SE=2:GOTO 60
50 IF PV<1 THEN 30 ELSE SE=1:TS=""
60 INPUT "For how many years will payments be made? ";TS
70 PRINT:YR=VAL(TS):TS=""
80 IF YR<1 OR INT(YR)<>YR THEN 60
90 INPUT "How many payments will be made each year? ";TS
100 PRINT:N=VAL(TS):TS="":IF N<1 OR INT(N)<>N THEN 90
110 IF SE=1 THEN 150
120 INPUT "How much will each payment be? ";TS
130 PRINT:IF TS="" THEN 120
140 PMT=VAL(TS):TS="":IF PMT<1 THEN 120
150 INPUT "What is the annual interest rate (%)? ";TS
160 PRINT:R=VAL(TS):IF R<=0 THEN 150
170 R=(R/100)/N:RR=1:T=1+R
180 FOR L=1 TO N*YR:RR=RR*T:NEXT L
190 PRINT:IF SE=2 THEN 220
200 PRINT "There will be ";N*YR;"payments of ";
210 PMT=PV*R*RR/(RR-1):T=PMT:GOTO 240
220 PRINT "You need an annuity worth ";
230 PV=PMT*(RR-1)/(R*RR):T=PV
240 F=LEN(STR$(INT(T+.005)))-1
250 PRINT USING "$"+STRING$(F,35)+".##";T;
260 PRINT ".":PRINT:END

```


Nobody's Perfect...

Game	Winner	Time to Move
1	SARGON III	5 seconds
2	SARGON III	5 seconds
3	SARGON III	15 seconds
4	SARGON III	15 seconds
5	SARGON III	30 seconds
6	Chessmaster	30 seconds
7	SARGON III	3 min
8	SARGON III	3 min

YOU CAN'T WIN THEM ALL.
We pitted Sargon III, the world champion, against the challenger. Head to head, with no punches pulled. And believe it or not, the champ lost one game to the challenger. But Sargon III beats Chessmaster 2000 almost everytime.

Sargon III is the result of more than twenty one man years of development. Sargon III will play at precisely the level of difficulty you desire. Ask Sargon III for a hint, take back a move you've already made, replay a sequence, change sides, or set up your own board for customized learning. Sargon III lets you study in detail more than 100 great games of history or review 45 classic chess problems,

all on screen. Sargon III also includes the largest library of opening moves available on any chess program.

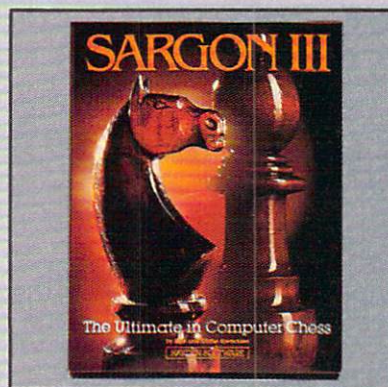
SARGON III WRITES CHESS HISTORY

In a tournament sanctioned by the U.S. Chess Federation, Sargon III beat

a master rated 2209. That makes Sargon III the only microcomputer program ever to defeat a player at that level.

Sargon III has no trouble wiping Chessmaster 2000 off the globe. Someday, maybe a chess playing program will be able to beat Sargon III. Until then, which chess program do you want to own: the world champion or the runner-up?

(Note: The test was run on two Apple II computers. Each program played once as white and once as black at each level. Send us \$5.00 for handling, along with a postage paid return envelope and we'll send you a copy of the moves each side played.)



Sargon III is available for: Apple II series, Apple Macintosh, IBM PC and Commodore 64/128 computers. You can find Sargon III at your local retailer or call 1-800-826-0706. Illinois residents call 1-800-826-1330. Only MasterCard, VISA and American Express accepted for phone orders.

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CIRCLE READER SERVICE 40

TELECOMPUTING

GUIDE TO COMMUNICATIONS SOFTWARE

You Need It to Make Telephone Calls with Your Modem

BY RIC MANNING

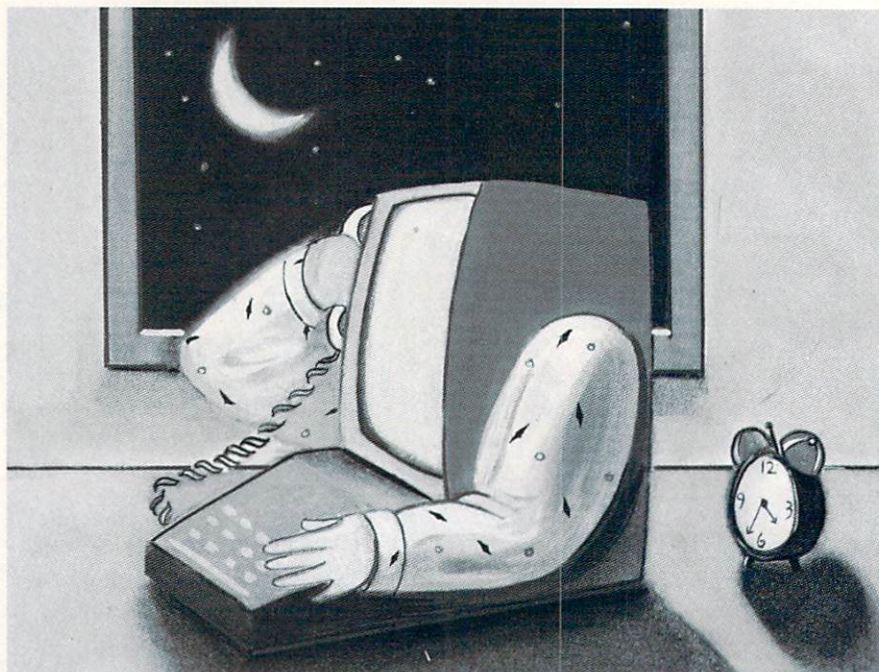
Communications software is the bridge between your computer and your modem. The software gives your modem commands to dial the telephone, shake hands with distant computers, mail your messages, and send and receive files.

But most programs can do much more. For example, some communications software can be programmed to wake up in the middle of the night, dial a bulletin board or timesharing service, log on with your personal password, check your electronic mailbox, and fire off a message to another subscriber.

MATCH THAT MODEM

The first thing to look for in a communications program is compatibility with your computer and modem. The program must work with both! If you have an Apple II Plus, for example, be sure your software isn't written strictly for the IIe. If you have an AT&T modem, make sure the software isn't written for a Hayes modem. And so on. Choosing communications software is much like choosing a word-processing program that will work with both your computer and your printer.

One way to solve many compatibility questions is to use the software that comes with some modems (see last month's guide to modems). Hayes, for example, bundles its *Smartcom* software with many of its modems. Commodore modem buyers also get a copy of *Common Sense*, a program designed primarily for communicating with Q-Link. While the software may not do everything you want, you know it will work and get you



up and running.

Because Hayes Microcomputer Products established itself early as the leading modem-maker, the Hayes commands have become the *de facto* standard for most modems. (ATDT, for example, tells the computer to dial a touch-tone phone.) That's why most software companies write their communications programs to use the Hayes commands.

COMMON FEATURES

To familiarize you with communications software before you shop, here's a look at some of the more common features, which exist to some degree in virtually all programs:

Capture buffers. With a capture buffer you can temporarily store data that appears on your screen, whether typed by you or your on-line connection. A couple of keystrokes brings the data to the screen to be reviewed, printed, or saved to disk.

The size of the buffer varies from program to program. For instance, *HomeTerm* for the Atari XL has a 7K buffer; *Crosstalk* for the IBM PC has a 66K buffer. However, even

small buffers are adequate because most programs periodically save the contents to disk, thus emptying the buffer so it can fill up again.

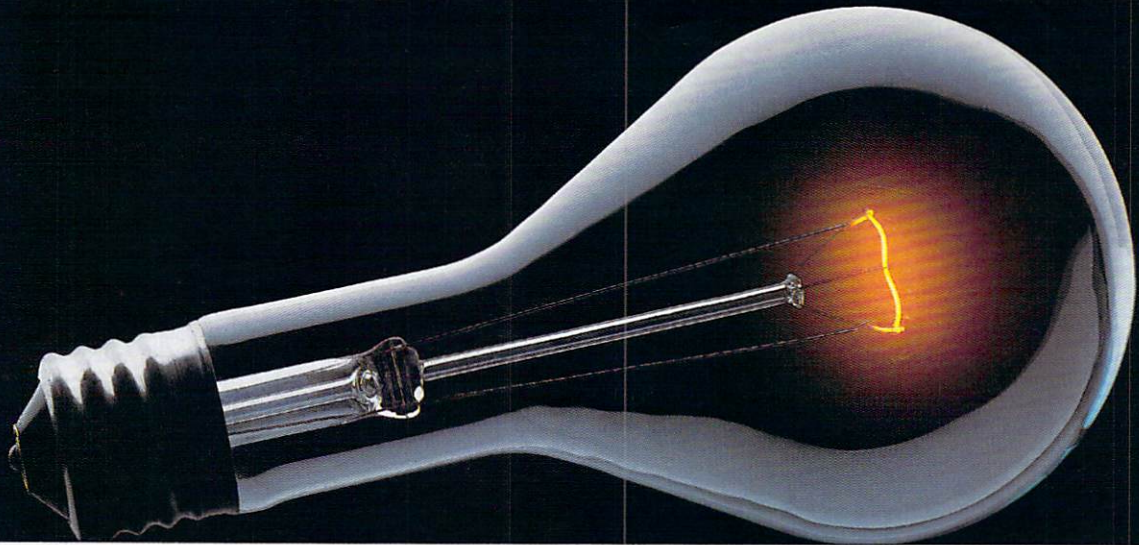
Macros. Logging onto a remote computer can be a chore. You have to remember the telephone number, the access node, and your ID number and password—and you have to deploy them all in the right sequence and format.

A macro is a series of keystrokes saved as a file, which you can invoke by pressing one or two keys. Thus, you can tell the computer and modem to automatically sign on to an information service without doing the legwork yourself.

Transfer protocols. As long as you're sending and reading mail or scanning the stock reports and news wires, most communications programs will serve you well. Exchanging text files is pretty simple stuff. But sending programs over phone lines can be tricky, since one small error or interruption from a "dirty" phone line will ruin the whole program.

To send programs—or text files that *must* arrive exactly as you sent

RIC MANNING, columnist for *The Courier-Journal* in Louisville, Kentucky and an editor of *Bulletin Board Systems*, wrote "Modems in the Mainstream" in last month's *FAMILY COMPUTING*. He welcomes electronic mail on *The Source* (ID: STG007) and *CompuServe* (ID: 72715.210).



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Company	Product	Computer Systems	Price	XM	KM	FE	MC	PD	AR
Antic Software (415) 957-0886 (800) 443-0100, ext. 133	Flash	Atari ST	\$40	Y	N	Y	Y	Y	Y
Apple Comp. (800) 538-9696	MacTerminal	Macintosh	\$125	Y	N	Y	N	Y	N
Batteries Included (416) 881-9816	Home Pak's Home Term	Apple II, Atari XE/XL, C 64/128, IBM PC, Macintosh	\$20- \$50	Y	N	Y	Y ²	**	Y
Bit Software (408) 263-2197	BitCom	IBM PC	\$69	Y	N	Y	Y	Y	Y
Brown-Wagh Publishing (305) 391-5033 (800) 451-0900	OnLine!	Amiga	\$70	Y	N	Y	Y	N	Y
CompuServe (800) 848-8990	Vidtex	Apple II, Atari XE/XL, C 64/128	\$40	N	N	Y	Y	N	N
Computerware (619) 436-3512	Color Connection	Tandy Color Computer 2/3	\$50	Y	N	Y	Y	Y	Y
Crosstalk Communications (404) 998-7798	Crosstalk XVI	IBM PC	\$195	Y	Y	N	Y	N	Y
Datastorm Technologies (314) 449-7012	ProComm	IBM PC	\$35- \$50*	Y	Y	Y	Y	Y	Y
Elliam Associates (818) 348-4278	MEX	CP/M	\$30- \$36*	N	N	N	Y	Y	Y
Felsina Software (213) 747-8498	A-Talk	Amiga	\$50	Y	Y	N	Y	Y	Y
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Hayes Microcomputer Products (404) 441-1617	Smartcom I Smartcom II	Apple II, CP/M, IBM PC, Macintosh	\$119- \$149	Y	N	Y	N	Y	Y
Headlands Press (415) 435-0770	PC-Talk III PC-Talk 4	IBM PC	\$35* \$99	Y	N	N	Y	Y	Y
Keith Ledbetter	850 Express	Atari XE/XL	NC*	Y	N	N	Y	Y	Y
Kent Engineering (315) 685-8237	MacroModem	Amiga	\$70	Y	N	Y	Y	Y	N
Microtech (612) 633-6161	XTerm	OS-9	\$50	Y	N	N	Y	N	N
MichTron, Inc. (313) 334-5700	Mi-Term	Atari ST	\$50	Y	N	N	Y	Y	Y
Norton-Lambert Corp. (805) 687-8896	LYNC	IBM PC, CP/M	\$195	Y	N	N	Y	Y	Y
Pinpoint Publishing (415) 654-3050	Point-to-Point	Apple II	\$129	Y	N	Y	Y	Y	Y
Progressive Peripherals (303) 825-4144	BobsTerm Pro	C 64 C 128	\$50 \$80	Y	N	Y	Y	Y	Y
Quinsept Inc. (617) 641-2930	TermExec	Apple II	\$95	Y	N	Y	Y	Y	Y
Software Publishing (415) 962-0191, ext. 500	PFS:Access	IBM PC	\$140	Y	N	N	Y	N	Y
Southeastern Software (504) 246-7937	Data Capture	Apple II, IBM PC	\$90- \$120	N	N	Y	Y	Y	Y
Transcend Corp. (415) 851-3402	PC COMplete	IBM PC	\$229	Y	Y	Y	Y	Y	Y
United Software Industries (818) 887-5800	ASCII Express MouseTalk ASCII Express Pro	Apple II Apple II, IBM PC	\$100 \$130- \$150	Y	N	Y	Y	Y	Y

HOW TO READ CHART:

XM - Xmodem KM - Kermit FE - File editing MC - Macros PD - Phone Directory AR - Auto redial

* Indicates public domain program. Often available through users' groups, bulletin boards or commercial distributors. Telephone number is for the author or a major distributor.

**Only for IBM and Macintosh versions.

¹ Atari version includes Commodore version. ² All except the Commodore version.

TELECOMPUTING

them—you need a more sophisticated transfer system that can check for errors on either end of the transfer. In addition, both computers need to use the same transfer protocol—or set of rules.

The most popular error-checking protocol is Xmodem, also known as Modem7. But there are several others also in use. Hayes software has its own transfer protocol and CompuServe offers its Vidtex protocol (as well as Xmodem). Micro users who want to communicate with mainframe computers will often use a newer protocol called Kermit.


In general, the more protocol options your communications software has, the better off you'll be. At the least, be sure it offers Xmodem, the most widely used protocol.

Simultaneous Printing. Most communications software allows you to activate and deactivate your printer "on the fly" with a couple of key-strokes. This print "spooling" is useful for short messages that you'd like to read later, but aren't worth saving to disk. A program that *cannot* print out while on-line is to be avoided.

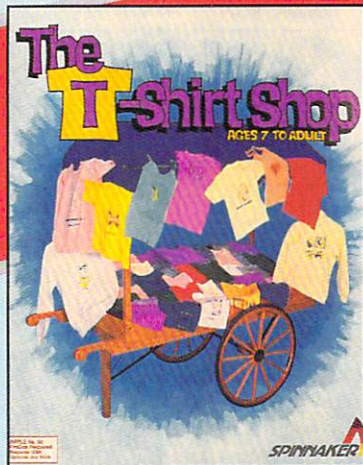
SPECIAL FEATURES

Text editor. A modest built-in word processor can be a handy tool for composing a brief message or editing a file you captured—without disconnecting from the host computer and/or starting a word-processing program.

Terminal emulation. Some programs will let your computer act like a terminal extension of a mainframe computer. The DEC VT100 terminal is the most widely used terminal, and thus the most common terminal emulation found in micro software. The IBM 3270 emulation is also popular. This feature, of course, is useful primarily if you are at a college or company that uses a mainframe.

Chat mode. A few packages will split the screen when you are "chatting"—or type-talking with an on-line friend. One part of the screen shows your remote friend's typing, and another part shows your own typing. The advantage of this system is that the two transmissions don't get mixed up and garbled. Plus, you have more control over what you type and send since you can read it more easily. 

T-Shirt Shop™



How to Design Your Own T-Shirt in Five Easy Steps

1

Get Started

The first thing to do is to boot up T-Shirt Shop. You'll be greeted by an easy to understand menu that lets you see everything the program can do at a glance. You can LOAD pictures from the picture disk, DRAW your own pictures, TYPE in any slogan you can think of, and COLOR in your pictures.

2

Choose a Graphic

Now choose LOAD from the menu. You can choose from more than 50 supplied graphics. Hollywood celebrities, political and historical figures as well as plants and animals represent some of the categories included. For a change, you can draw your own picture. In either case, once you choose a picture, the outline will appear on the screen, ready to be colored.

3

Paint It

Here's your chance to show your artistic ability. Using the palette of colors, the brushes and the sprayscans, you can paint a rainbow of color – you can even color in the picture to match your eyes! If you want, the program will automatically paint the picture with colors you choose.

4

Add Type

You've got a beautifully colored picture now. Go to the TYPE section, and choose from a variety of type styles. Name your picture, or attach some absurd sayings. Create catchy political slogans, humorous sayings, or something incredibly tacky.

5

Print It

Print your shirt design onto the special iron-on transfer paper (free sheets are included). With T-Shirt Shop, what you see on the screen is exactly what you'll get on your t-shirt. The paper will work with any ribbon – even in color – and will transfer perfectly to any t-shirt. Print your design, iron the transfer onto your shirt and you're in business. Impress your friends! Wear them into the office, to the beach, or to a wedding. T-shirts make great gifts, too!

T-Shirt Shop is the only program that allows you to design, paint and create your own t-shirts. In just minutes you'll be wearing your creations. Be the first on your block with a custom designed t-shirt, sweatshirt or even underwear...from T-Shirt Shop.

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MACHINE SPECIFICS

NEWS, OPINIONS, QUOTES, & RUMORS ABOUT YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

Hardware and software for the IIGS has been a bit slow in arriving, but I've been busy testing an assortment of older II products to get a feel for the machine. Here's a quick report.

The GS is a powerful, complex machine, not to be approached lightly. But, as with most powerful computers, you need to expand the basic system considerably to achieve effortless operation. Apple ships the GS with 256K of RAM. While this is twice as much memory as on a IIc, and four times as much as on a II Plus or unexpanded IIe, it is not enough to support the kind of programs that will be written for the GS.

RAM Hogs. Graphics-oriented programs are noted RAM hogs, and powerful multifunction software also needs plenty of breathing room. Almost every GS user will find additional memory a must (as do 256K Amiga owners), and there is an array of expansion cards available, ranging from 1 to 8 MB.

The GS, like most powerful computers, tends to be disk-hungry as well; it uses large programs that seem to generate large data files. While one 800K 3.5-inch drive is sufficient to run many programs, most GS owners will also need a 143K 5.25-inch drive to access older Apple II software. My test system is equipped with one of each. It's a workable, if occasionally awkward, configuration that would be much improved by a second 800K drive. A hard-disk would be better yet.

The GS is supposed to run "virtually" all Apple II software, but I've found at least one area of incompatibility. The GS uses the RS422 serial standard pioneered in the Mac, which is incompatible with communications software written for most older Apple II serial ports.

Since most commonly used printers are parallel, this didn't bother me—until I brought home an ImageWriter II (with a serial interface), and couldn't persuade my daughter's favorite IIe program to print the color image I had promised her. I'm sure that software updates will remedy this situation, but for now, a GS

owner who wants to use an ImageWriter or an external modem with old Apple II software may not be able to use the built-in port.

MacQuickie. I've finally gotten hold of *FullPaint* from Ann Arbor Softworks Inc. (2393 Teller Road, Newbury Park, CA 91320; [805] 375-1467; \$99.95 for a 512K Mac), and it's a honey. It can read *MacPaint* files directly and allows you to have up to four windows open at once, to use accurate rulers like *MacDraw* does, and to rotate objects a few degrees at a time. Plus, you have more control over a bigger area of the screen.

CHARLES H. GAJEWAY can be reached on *The Source* (ID: BBQ794) or on *GEnie* (ID: CGAJEWAY).

ATARI

BY JOHN J. ANDERSON

At Comdex (Computer Dealers Exposition), and CES (Consumer Electronics Show)—both trade shows held in Las Vegas recently—desktop publishing was a buzzword. Good desktop programs were in abundance for the ST. CAD (computer-aided design) was another big area.

Many exhibitors at the Atari booth had a 1040ST, a hard drive, and a laser printer. The printers were lent by QMS, Hewlett-Packard, Canon, and others. Atari itself showed a laser printer it plans to sell for about \$1,500. Two WYSIWYG ("what you see is what you get") publishing packages, *Publishing Partner* from Softlogik ([314] 894-8608; \$149.95) and *Fleet Street Editor* from Mirrorsoft, a British company (011-44-1-377-4600/4384; \$172.50), attracted lots of attention. Also shown was the new *Typesetter Elite* from XLEnt Software ([703] 569-8881; \$49.95) and the command-driven *LaserType* from Softlab ([801] 628-4969; \$279).

What a CAD! Progressive Computer Applications had its *Graphic Artist* program ([301] 340-8398; \$199.95) working with a huge IOLION (Houston Instruments-compatible) plotter, creating all kinds of architectural designs, page layouts, and pictures. Also in the CAD area, Foresight Resources Corp. had a top-notch package called *Drafix 1*

([800] 231-8574; \$249). According to Foresight, it runs as fast on an ST as it does on an IBM PC/AT (running at 8 MHz with a math co-processor!).

Generic Software's *FirstCADD* ([800] 228-3601; \$49.95) was also a popular exhibit, as was Abacus Software's *PC Board Designer* ([616] 241-5510; \$195).

XL RAMdisk. Those of you with 130XEs already know the power of the RAMdisk. A RAMdisk configures a part of the computer's memory so it can be treated just like a disk drive, boosting speed and convenience (at the cost of available memory, of course).

Good news! There is a chunk of unused RAM area in the XL series that sits under the ROM and is used only occasionally by BASIC XE and a few other programs. You can renovate it into a mini RAMdisk with the following quick steps:

1. Boot with DOS 2.5 and BASIC.
2. Type the following:
POKE 1802,PEEK(1802) + 128 [RETURN]
DOS [RETURN]
L [RETURN]
RAMDISK.COM [RETURN]
I [RETURN]
8 [RETURN]
Y [RETURN]
D [RETURN]
D8:DOS.SYS [RETURN]
Y [RETURN]
B [RETURN]
POKE 5439,56 [RETURN]
DOS [RETURN]

The DOS menu (which is actually the disk utilities package called DUP.SYS) will now come up instantly, loaded from a RAMdisk known to the computer as drive 8. You can put away your DOS disk. This quick RAMdisk is limited to 15K (even less, once DUP.SYS is resident), and that is not enough room to cache a complex program or reams of data. But if it fits, any chunk of code can be kept there for instantaneous RAMdisk retrieval.

JOHN ANDERSON can be reached on *CompuServe* (ID: 76703.654).

COMMODORE

BY SHAY ADDAMS

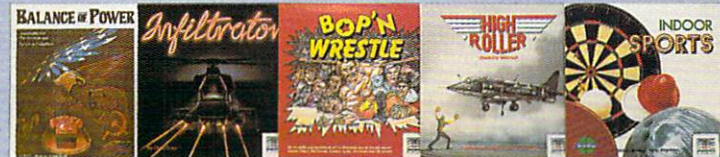
Recently, I complained that *geoWrite* won't load sequential text files writ-



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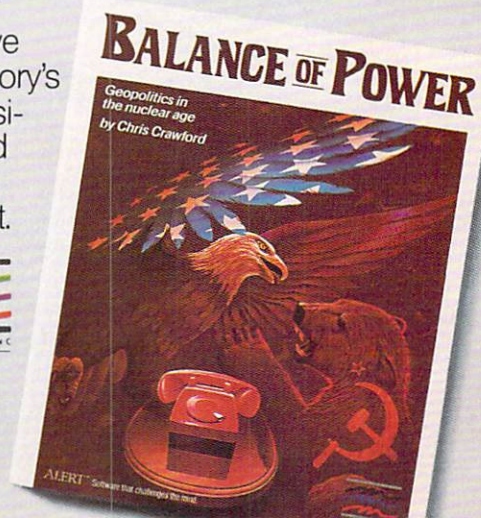
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CIRCLE READER SERVICE 52



MACHINE SPECIFICS

ten with other word processors. Now the *GEOS Writers Workshop*, in addition to *geoWrite 2.0* and *geoMerge*, provides a utility that converts *PaperClip* and *EasyScript* files, complete with formatting. You can also convert files from other programs, but you lose the formatting.

If you don't need *Workshop*, two alternatives exist: From QuantumLink's *GEOS* section, you can download a "seq to text-scrap," a program that converts a PET ASCII or standard ASCII file into one that may be pasted into a *GEOS Text Manager Album* or directly into a *geoWrite* document. Or you can buy it for \$4 from *Kids Computer News* (c/o St. Hilda's & St. Hugh's School, 619 West 114th St., New York, New York 10025, attention Tom Trocco; [212] 666-9871). Besides 293 pages of useful information, *GEOS Inside & Out* (Abacus Software; [616] 241-5510; for C 64 only; \$19.95) includes *Filemaster*, a type-in program that will change a text, program, or data file into a *GEOS* file and let you edit an icon or create a new one.

Print Shop Problems. I've been getting lots of mail about *The Print Shop* and *The Newsroom*. Three people couldn't get one or both of the programs to print with Commodore's MPS-802. And they never will: The 802 prints block-style graphics, but *The Print Shop* and *The Newsroom* do bit-mapped graphics. There's no way to correct this with an adapter or interface, either. Commodore's 1526 has the same problem. The Commodore 803 and Okimate 10 and 120 will work, but compress the hard copy by a half-inch.

Some printers that do work with both programs are Commodore's VIC 1525 and MPS-801, Star Micronics' 10-X and 15-X, the Okidata 92 and 93, and most of the Epsoms. Before buying such software, it's wise to call the manufacturer to ask if your printer is supported.

Marie Porolniczak of Sterling Heights, Michigan, reported that *The Print Shop*'s "main menu would not appear when I tried to load it from a 1571." It turns out some of the early versions aren't compatible with the 1571. Broderbund says to send the program back marked "Attention: Software Direct," and request that it be tested on a 1571. If the problem is verified, Broderbund will send you a disk that works.

Tom Lardner of Nutley, New Jersey, complained that the Okimate 10's end-of-page function causes it to skip 10 spaces and "ruin my work when I print a banner with *The Print Shop* or *The Newsroom*." He wanted to know how to disable this printer function. Okidata replies that the following command should turn off this "end-of-the-page" feature. For Commodore systems, type: OPEN3,4:PRINT#3,CHARS(27);"B":CLOSE3 [ENTER].

Call (800) OKIDATA for technical support. For questions regarding *The Print Shop* program, the support number is (415) 479-1170; and for *The Newsroom*, (612) 944-3912.

SHAY ADDAMS can be reached on CompuServe (ID: 72267.601) or QuantumLink (ID: JB CHALMER).

IBM

BY HENRY BEECHHOLD

If you don't succeed at first, try and try again. I suppose that could be said of IBM's new computers. Rumor has it that IBM is creating a low-cost version of the popular PC line, with good color graphics designed for home and school use. The new computers are in some ways reminiscent of the PCjr. But indications are they are big-league juniors.

According to early trade reports, the base price of the machines will be in the \$1,100 to \$1,500 range, though it's not exactly clear what that price will get you. A full 640K RAM, built-in color graphics, and one or two disk drives can be expected. The disk drives will be 3.5-inch, the same variety used in the IBM PC-Convertible laptop computer. The computers are expected to run virtually all existing IBM-PC software (it will have to be converted to the new disk format, however), as well as new software designed to take advantage of the high-resolution color graphics.

Speaking of the PCjr... Owning an orphaned computer can leave one feeling mighty low. Happily, The PCjr Club (P.O. Box 59067, Schaumburg, IL 60159) is waiting to help, with a monthly newsletter and all kinds of hardware and software information. Membership is \$18 a year.

If you'd like to turn your PCjr into a PC or PC/XT workalike, contact

Racore Computer Products Inc. (170 Knowles Drive, Suite 204, Los Gatos, CA 95030; [408] 374-8290). Racore offers a variety of PCjr upgrades (keyboards, floppy- and hard-disk drives, and memory expansion for \$49-\$349). Racore's upgrades should allow your PCjr to use any PC software that's designed to fit within the amount of memory you've added, but check with Racore for specific compatibility.

HENRY F. BEECHHOLD is author of *The Brady Guide to Microcomputer Troubleshooting & Maintenance* (Simon & Schuster, \$17.95).

MS-DOS

BY STEVE MORGENSTERN

While recent experience tells us to look to the Far East for the next wave of PC clones, a not-quite-new machine is reaching these shores from the land of crumpets, Wimbledon, and the Queen. Amstrad, a British company which has marketed a dedicated word processor through Sears stores, is now bringing their PC1512 MS-DOS computer to the States.

In its basic configuration, the machine includes 512K memory, an 8086 CPU running at 8 MHz (versus the IBM standard 4.77 MHz), built-in monochrome and color display adapters, built-in parallel, serial, and joystick ports. The Amstrad comes with a monitor (monochrome or color) and a Microsoft-compatible mouse. Add to that a standard software package with MS-DOS 3.2, the *GEM Desktop*, *GEM Paint*, and *GEM-based Locomotive BASIC*.

Yours For Just \$899. With all that hardware and software, the suggested price for a two-drive system with monochrome monitor is \$899. A fully loaded system, with one floppy drive, a 20 megabyte hard disk, and color monitor, is still a modest \$1,499.

Amstrad is by no means a no-name clone. Amstrad is a leading manufacturer in Europe and is reportedly selling 70,000 PC1512s a month on that side of the Atlantic. More information is available from Vidco, Amstrad's only U.S. distributor ([214] 521-7010).

STEVE MORGENSTERN can be reached on CompuServe (ID: 72545.606).

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MACHINE

TANDY

BY STEPHEN MILLER

There seems to be some kind of natural law in computing that decrees that you never have enough storage. When you used a tape recorder, you really needed a disk drive. Once you got the disk drive, you needed a second one. Then you start looking at a hard-disk drive.

Tandy's 20 Meg Hard Disk Card, despite an initial gulp at its price tag (catalog no. 25-1029; \$799), turns out to be quite a bargain. Compared to the old Tandy 10 megabyte drive, The Hard Disk Card's selling point is that you get twice the storage capacity—and get a hard-disk controller with it (saving \$200).

Installing a Hard Disk Card.

The Hard Disk Card is user installable—and that is where problems arise. There is nothing more frustrating than a good product that is hampered by incomplete or inaccurate instructions.

The first glitch I encountered was with instructions in the Tandy 1000 SX manual on installing expansion boards. The cover comes off the SX easily enough, and everything is where it is supposed to be, except for an undocumented aluminum bracket over the expansion slots. It has to be removed to install boards, but how do you remove it? There are no screws, no little warning labels, or anything, for that matter.

After much head scratching, I take a deep breath and wiggle it. Voila, it lifts right out! No big deal.

A 30-Second Job. After removing the three small screws that secure the back cover (more head-scratching), installing the card took all of 30 seconds. Getting the hard card ready for use was another matter. According to the printed instructions, you should be able to run the installation program, and everything will be fine. When I ran the installation program, the disk wouldn't format. After several tries, I was about to call Tandy for help when I decided to check what was on the installation disk. There was a file called READ.ME. In that file were the instructions on what to do if the installation program doesn't work.

The file is in plain, understandable English, and 10 minutes later, I happily loaded up the disk with pro-

SPECIFICS

grams. Why didn't anyone tell me?

CoCo 3 Painting. For non-Coco 3 owners, here's what happens when you press CTRL-ALT at power-up. You get the computer equivalent of a signed painting. The CoCo displays a portrait (and a very nice one at that) of the three Microware programmers who wrote the additions to Extended Color BASIC 2.0.

STEPHEN MILLER is a journalist and small-business consultant.

ORPHANS

BY PATRICK SPERA

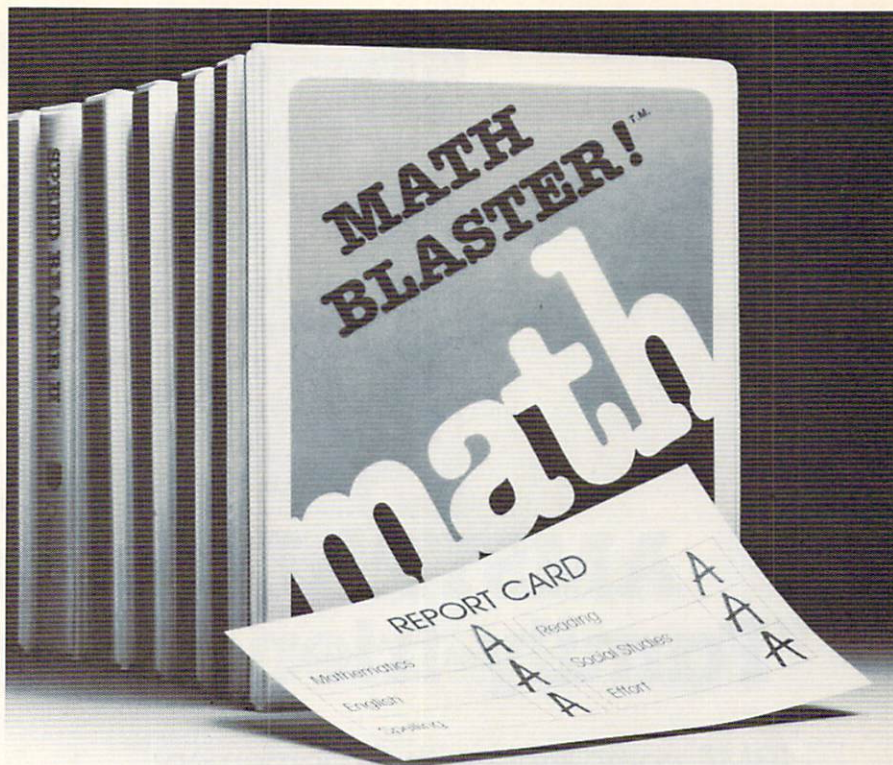
A little programming gem comes to us from Gregg Noblett of Paterson, New Jersey. He was working on error-trapping a SmartBASIC file and wanted to make his work a bit easier. When an error was detected, the program would jump to this subroutine. It would tell him the line number on which the error occurred and what the error code was. Once he fixed the problem, he could return to that line to continue debugging. This is a simple version of his Adam program.

```
1 ONERR GOTO 60000
100 FOR X=65500 TO 65540
110 Y=PEEK(X)
120 PRINT Y
130 NEXT X: END
60000 E=ERRNUM(1)
60010 EP=PEEK(16124)+(256*PEEK(16125))
60020 EP=EP-4
60030 EV=PEEK(EP)+(256*PEEK(EP+1))
60040 PRINT "ERROR OCCURRED AT LINE #
":EV
60050 PRINT " WITH A CODE OF ":E
60060 END
```

Second T/S Fest. The second Midwest T/S Computer Fest will be held May 2 and 3, in Indianapolis, Indiana.

If you want more information, send a self-addressed, stamped envelope (SASE) to Paul Holmgren (5231 Wilton Wood Court, Indianapolis, IN 46254) or to Frank Davis (523 East Main St., Peru, IN 46970). Updates can also be found on Computer Club Forum on CompuServe (GO CLUB) or on the ISTUG BBS ([317] 898-3903). The BBS, by the way, is run on a TS 2068 computer!

PATRICK SPERA can be reached on CompuServe (ID: 76703.4350), and is administrator of the Computer Club Forum (GO CLUB), a home for orphaned-computer owners.



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That freedom of being on your own is an exciting and worthwhile goal. You can do it, if you're willing to pay the price—a lot of hard work, longer hours, and possibly less money than you make as an employee. You'll have to plan for your own retirement, buy your own

MICHAEL C. THOMSETT is a freelance writer who contributes to several magazines, specializing in business management. He is working on his ninth book and is based in Northern California.

ILLUSTRATION BY GEORGE BOOTH

insurance, and give up paid holidays. Still, the allure of independence is there, and thousands make the move each year.

Owning a computer is the inspiration that motivates many people to strike out on their own. The technology enables them to compete in the marketplace, so they match ideas to demand, and a new business is off and running.

Thousands more who already operate a small business see the computer as a means of expansion. Rather than hiring extra employees, these small business owners choose to automate in order to take on more work, to make their work easier and more efficient, and to operate more professionally.

It is often the combination of frustration with a job or career and the perception that there is a demand for our services, that leads us to stop working for someone else and to start up a full-time home business.

BEFORE YOU BEGIN . . .

Before you chase that dream, look at the whole idea carefully. For most startups, success comes from planning well in advance, researching your market, and developing a business plan. You'll need to consider not only the financial, but the personal aspects of quitting your job and working at home every day, without the support of your peers. Here are seven steps to help you start off on the right foot:

STEP 1: ASSESS RISK.

The first stage of planning involves calculating how much risk you are willing to take.

THE STRUCTURE OF A BUSINESS PLAN

You can put together your own business plan, a kind of blueprint for the success of your business.

When a contractor builds a house, he needs a plan. It tells him where to build, what materials to use, how many rooms and of what sizes. It also gives him a schedule and deadline, a budget and the amount of labor that will be required to do the job right the first time.

That's exactly what a business plan should accomplish for you in your new business.

Keep it simple, and include these elements:

1. Business description. Write down what business you think you will be in. Describe the products and services you plan to offer, and to whom.

2. Your personal goals. Put in writing exactly what you hope to achieve during the next year, in terms of volume, profits, equipment, and numbers of customers.

3. Your market. Research your customers and the competition as part of the plan. You should know in advance exactly what you're up against. Is there a strong demand for what you plan to offer?

4. Forecasts and budgets. Estimate your income and expenses for the next 12 months. Be as realistic as possible, and include detailed breakdowns for each month.

5. Timetable. Set specific dates for reaching your goals.

CASE HISTORY No. 1



Jim Bridges
Communications,
Automation,
Control
Bethlehem,
Pennsylvania

"I'd been wanting to get out on my own for some time," said Jim Bridges. He formed CAC (Communications, Automation, and Control) to market a program he devised to tabulate sales for fund-raising organizations.

Bridges' startup experience is a good example of the need to develop a thorough business plan. Excited about the potential of the program he developed, Bridges plunged right in without researching his market thoroughly. He has since discovered that the seasonal efforts of the fund-raising organizations upon which he depends for income weren't enough to sustain cash flow for the entire year.

Bridges began working at home full time from his finished basement now converted into an office. He now plans to expand into other services, based on the potential of his computer, and this time making a careful market analysis before he makes an investment of time or money.

Bridges owned his computer before going on his own. It is an AT&T 6300 (IBM compatible) with 640K RAM, one floppy, a 20-MB hard disk, and a dot-matrix printer.

His advice: "Start off slowly, and research your market carefully. You have to realize you'll be working by yourself for a long time."

Consider what you need to earn, what your expenses are, how much of a market there is for your services or products, and whether you're the type who can live with uncertainty. Are you a risk-taking entrepreneur, or the type to go strictly by the numbers?

Numbers are where most new business owners put their emphasis, if they plan at all. They're important, but the numbers you put down on paper (see "The Structure of a Business Plan") won't breathe as much life into your business as will your personal efforts.

Despite careful planning, you cannot automatically assume that your business income will steadily increase. As a business planner, you can't go by the straight-edged ruler—because in the real world, businesses don't grow in straight lines. You'll encounter a series of starts and stops, little successes and changes in direction. In the end, your success and happiness hinge on planning, hard work, and the ability to think on your feet.

When Steve Wozniak and Steven Jobs started Apple Computer, they had done no financial planning. It didn't occur to them that they had a viable business at all until the first Apple computer was developed, and people started reacting positively to the affordability of computing power. Wozniak now recommends that anyone planning to start a business should get experience in a corporation, earn a business degree, develop a business plan, and limit risks—everything he didn't do! Of course, both Wozniak and Jobs were 20-year-old college students at the time, without mortgages or families to support. (And what would the world be like if all reckless dreamers followed Wozniak's advice?)

STEP 2: PLAN THE STARTUP.

Detailed planning is essential in the beginning. Will zoning allow you to run a business in your neighborhood? What's the competition offering? Should you incorporate? Is there a need or demand for your product or service? Will it be seasonal? How can you make the best use of your computer? Your operation will proceed much more smoothly if you've done your homework.

Be careful to investigate and satisfy the requirements of all local and state regulatory agencies. Ask other self-employed people in your area what is required, pay the fees and deposits, and avoid trouble before it happens.

Check the zoning in your neighborhood before you set up shop. The laws are different in every city and county. Some jurisdictions may even limit the ways you can use a computer in your home in a professional endeavor. Penalties for trying to avoid legal requirements can be stiff, and ignorance of the law will not excuse violations. For example, one California man was selling antiques from his home, using his garage as a storage space. He did not have a required resale license. The State Board

of Equalization (responsible for collecting sales and income taxes) found out about his business when he filed his state income tax return. He was assessed a fine, plus a retroactive six-percent tax based on gross sales.

STEP 3: CREATE A PROFESSIONAL IMAGE.

Building a positive business reputation is crucial. Think about the message you'll project in everything you do, from answering the telephone to advertising and billing. It's important to set a professional tone for your business from the beginning—you'll find it pays off.

Rather than relying on your private line, it's best to get a separate business telephone and isolate yourself from the distractions of home life. If you must be away during business hours, use a telephone answering machine or a top-quality answering service.

The telephone itself can be a tremendous boon, or a chronic problem. A prompt answer and professional manner can turn an exploratory call into a loyal customer, but if young children answer the telephone, if the television is on in the background, or if there's no one there to answer at all, you'll make a negative impression on your customers. If you telecommunicate, you should install two business telephone lines, so important calls won't be missed while your modem is in use.

Image is important—even the letterhead, envelopes, and business cards you use convey a message. As a home-based business person, you may encounter negative perceptions about your qualifications. Make sure you maintain a professional tone, and your customers will feel confident trusting their business to you.

STEP 4: FIND THE MONEY, AND KEEP IT COMING.

Most small businesses succeed because they are equipped with enough capital not only to start out, but to continue comfortably in operation. Your business plan might project earnings that would be more than adequate to support yourself and pay your overhead expenses, but the money has to keep coming in.

To guarantee that you'll be able to survive a few months when receipts will be low, you should start out with some money tucked away. Overhead expenses must be paid every month, even when income is low. And your personal expenses—now dependent upon your business—are a constant. These uncertainties often keep potential entrepreneurs working at more secure jobs while they pursue home businesses as sideline enterprises.

If you already own a computer, a major cash hurdle is out of the way. Still, there are other startup costs and investments to consider: the necessary business equipment, office supplies, advertising, accounting services, and licenses.

When estimating what you will need to

CASE HISTORY No. 2



Terry Fertig
Freelancer
Skokie, Illinois
Terry Fertig has been working at home for 11 years as a freelance writer and editor in the educational publishing field. She currently bills about \$15,000 per annum. "The computer's a necessity for me," Fertig emphasized. "Without it, I could not put out the volume of work I do now in the same amount of time. My business provides the family's second income, but if I were on my own, I doubt it would be possible to make a living without the computer."

Fertig's writing and editing consists primarily of projects in the educational field. She found it natural to work as a freelancer in the field because of her teaching background and a Master's Degree in education. One of her clients is World Book, the encyclopedia company.

Her home office is a room dedicated solely to her business. She feels this is especially important when there are children. She uses an Apple IIe with two disk drives and a NEC-2000 letter-quality printer. Her workhorse word processor is Word Juggler (Quark).

Her advice: "The main problem with beginning your own business at home is financial uncertainty. Being a freelancer, you never know what's coming in the future."

earn in order to run your business, do not overlook the extra expense burdens you will have to carry. Include the cost of benefits now paid by your employer: retirement account (IRA and Keogh), health, disability and life insurance, for example.

Rather than launching your business with an infusion of borrowed money from the bank,

INFORMATION SOURCES FOR NEW BUSINESSES

Free and low-cost information is available from many government sources. Example: In the booklet, "Computer and Mathematics-Related Occupations," (see below) a number of jobs are broken down by working conditions, training, qualifications, advancement, the job outlook, and earnings. It includes estimates of growth in computer-related fields, and lists sources for additional information.

Send away for these booklets and pamphlets for planning and managing your home-based business:

INTERNAL REVENUE SERVICE

Check your phone book under Internal Revenue Service for a local number for ordering these free publications:

NO. DESCRIPTION

- 334 Tax Guide for Small Business
- 533 Self-Employment Tax
- 534 Depreciation
- 535 Business Expenses and Operating Losses
- 560 Tax Information on Self-Employed Retirement Plans
- 583 Recordkeeping for a Small Business
- 587 Business Use of Your Home

CONSUMER INFORMATION CENTER

Write to the Consumer Information Center, P.O. Box 100, Pueblo, CO 81002, for the following publications:

NO. DESCRIPTION

- 121N Computer and Mathematics-Related Occupations; 15 pp., \$1.
- 122N Help Yourself to a Midlife Career Change; 9 pp., \$2.25.
- 126N Merchandising Your Job Talents; 21 pp., \$2.75.
- 516N Checklist for Going Into Business; 7 pp., free.
- 453N How to Get Started With A Small Business Computer; 10 pp., \$0.50.

SMALL BUSINESS ADMINISTRATION

The following publications are free from the Small Business Administration, P.O. Box 15434, Fort Worth, TX 76119:

NO. DESCRIPTION

- 1.003 Keep Pointed Toward Profit
- 1.004 Basic Budgets for Profit Planning
- 1.015 Budgeting in a Small Service Firm
- 1.016 Sound Cash Management and Borrowing
- 1.018 Checklist for Profit Watching
- 1.020 Profit Costing and Pricing for Services
- 2.010 Planning and Goal Setting for Small Business
- 2.022 Business Plan for Small Service Firms
- 4.002 Creative Selling: The Competitive Edge
- 4.008 Tips on Getting More for Your Marketing Dollar
- 4.019 Learning About Your Market

use reserves or try to raise the capital yourself; you'll start out with a clean slate. You don't need the burden of paying off a loan when you start out in your business. Don't depend on outside financing to get yourself going.

There are two saving forces that can keep you in business even when you don't have substantial reserves. One is the working spouse who can provide a steady income to meet your personal expenses each month. The other is the First Family Bank, also known as the LFD (Loan From Dad)—perhaps not a textbook method for going into business, but the lifeblood of many a new business, when family resources allow.

Once your business is up and running, you must collect money from your clients. Most important, put all agreements in writing, and don't be afraid to ask for money. Remember, your customer has received something of value from you.

Historically, the longer you let a debt go, the less likely you'll ever receive the payment. To keep on top of collections, make a list that shows which receivables are current, and which are 30 days late, 60 days late and longer. Identify a point at which you'll cut off a client and won't do any more work until the account is up to date. Setting these specific policies will go a long way toward reducing collections and keeping you in the black.

STEP 5: MANAGE YOUR EXPENSES.

Balancing your marketing effort against overhead is a big job by itself. But there's more to know so that costs won't get out of hand. As a self-employed person, you need to master a number of skills beyond the ability to bring in the money. You must also be an expert in many facets of business management.

Tax planning will be a big part of your job. When you are an employee, taxes are taken out of your paycheck for you, and you become accustomed to paying as you go. You are still required to prepay income taxes (both federal and, if applicable, state), by making periodic deposits. That requires putting out more money, a difficult burden if you are also having problems collecting from your clients.

It's a matter of very careful budgeting. Your tax estimates are due for each year on the 15th of April, June, September, and January. The amount due is based on what you expect to earn, your itemized deductions, exemptions, and other income. One-fourth of your total estimated liability should be paid on each of those dates.

A troublesome tax aspect of being on your own is the so-called self-employment tax. This is an additional tax you must pay for social security benefits and is due in addition to your regular federal income tax liability. The burden increases every year that Congress raises social security benefits (tied to the rate of inflation). For 1986, the self-employed have to pay

CASE HISTORY No. 3



Robert Linton
The Linton Factor
Walnut Creek,
California

"Being a stockbroker gave me independence, to a degree. I read about telecommuting in an article in The Wall Street Journal in March, 1985, and got the idea to start my own business."

The Linton Factor hires self-employed home workers to complete data entry for clients. Clients range from investment firms compiling research to accountants contracting for bookkeeping input. This service enables others to avail themselves of automated service without investing in hardware, software, and training. Linton also sponsors seminars for people interested in starting their own home businesses.

Linton has converted one bedroom in his home for the venture. "I'm in a new business," he says. "It requires experimenting in different areas, and I'm not sure yet in which area I'd like to specialize."

He uses a Leading Edge (IBM compatible) computer with a 10-megabyte hard disk, and has a color monitor and a modem. Linton's southern California associates use an HP LaserJet printer and he uses an IBM Proprinter in his home office.

His advice: "You must have plenty of patience. Everything in your new business will take more time and cost more money than you plan for."

12.3 percent of net earnings. If you earned the maximum of \$42,000, the total self-employment tax is \$5,166.00. Anything over \$42,000 is exempt. The 1987 rate will be a little higher.

All of these factors point to the need for complete record-keeping systems and careful tax planning. For example, you can legally delay the receipt of income until the following year, reducing this year's liability, and you can plan purchases of supplies to increase this year's deductions.

Records will also support your deductions. All of your business expenses are deductible, but you must be able to verify what you spend. For many self-employed, the question of deductions becomes an obsession. Toward the end of the year, you may find yourself frantically looking for deductions wherever they can be found.

As a business owner, you will also be responsible for your own retirement. You are not automatically covered under an employer's pension or profit-sharing plan, as are many employees. It is now up to you (unless you are willing to depend entirely on Social Security).

The better manager you are, the better your chances of staying in business, and the better your image among clients.

STEP 6: BE HONEST WITH YOURSELF.

It would be unusual for a home business startup to go smoothly from the beginning. Inevitably, you are going to run into hitches. You can plan for many of these—cash flow, marketing, administration. But a big adjustment you'll have to make is working by yourself, every day. Working alone can be a shock.

Many who have gone through the transition suggest starting your home business while you're still working for someone else. Don't overlook the value of a steady income, employee benefits, and the social contact of a bustling office.

STEP 7: ENJOY YOUR FREEDOM.

Even with all the red tape, extra expense, risk, and isolation of working at home, millions of Americans want to take the plunge.

Most will work harder than they did for someone else; some will quit in discouragement, many more will find the freedom they seek. The experience of having to function in the structured and often stifling environment of a large corporation inspires many creative and energetic entrepreneurs to quit the race and set up shop at home.

The most important form of freedom you will experience on your own is creative freedom. You have complete control over the direction your business takes, and are not limited by corporate policies or politics.

Do you still want to work at home? If you were destined for that life, nothing will deter you. In fact, knowing how to get started will make you better prepared to make your move.

10 WAYS YOUR COMPUTER CAN HELP RUN YOUR BUSINESS

In the past, the output of self-employed people or individually owned businesses may have suffered from a "home-made" feel. Now, since every kind of business is so dependent on microcomputers, home workers can present a professional look to their work that is often indistinguishable from that of big businesses. At the same time, a computer can benefit home-based businesses by doing work that previously required full- or part-time employees.

Here are just a few of the ways in which a computer can help your business.

1. Presentation. You are a small fish in a big pond, but your computer can help you emulate the big fish. If companies or clients are used to transferring data on IBM disks, you can do the same. If they are used to dealing with Macintosh-generated graphics, you can generate those graphics. If they use certain electronic mail systems, you can use the same systems. If they dial mainframes, you can emulate their dumb terminals. If they like laser-printed documents, you can produce them. You may be Mom and Pop, but the outside world will know you as President.

2. Writing. By now, the advantages of word processing are so well accepted, they can be overlooked. But don't do that! Every business generates a lot of written material. A computer can do that with aplomb and grace. And because it can print letter-quality documents, you don't have to be (or hire) a professional typist.

3. Mass Mailings. Want to advertise, promote, sell direct? Many word-processing programs have a mail-merge feature, which allows you to write one letter and address it to hundreds of people. The addresses come either from a file on your word processing program, or from your database program. Alternatively, you can use an electronic mail system to generate a mass mailing.

4. Communications. So you're in San Diego and your partner's in Cleveland. You don't necessarily have to be close to the people you work with—be they clients or colleagues. Sending and receiving messages by electronic mail is in many ways superior to telephone communications, because you don't have to get the other person on the phone. If the person you want to reach doesn't have an electronic mailbox, electronic mail services such as MCI Mail will send laser-printed letters, on your own letterhead and with your own signature. Because the mail is sent electronically across the country and then printed out, it's faster than the U.S. Postal Service. And the laser printing gives a more professional look than the old-fashioned "mailgrams."

Finally, you can send data electronically to a typesetter, who will send you back reproduction quality galleys. This method is considerably cheaper than the old-fashioned way, when typesetters charged for the time they spent keying in text from typewritten manuscripts.

5. Design/Graphics. With a desktop-publishing system—page layout software and a laser printer—you can create your own newsletters, brochures, and promotions. In short, you don't have to hire a graphics designer and a typesetter. Of course, you need some sense of design to make the effort worthwhile.

But even if you don't produce full-fledged newsletters, you can design your letterhead and your business cards, with a program such as *MacDraw* for the Macintosh. And, you can use presentation graphics programs to dress up charts and diagrams that you show to clients.

6. Phone Support. Beyond sending data over the phone lines, a computer can help you organize your "voice" calls as well. For instance, you can call up a name and/or number from your computer, push a key, and the phone will dial the number for you. You can also buy software that has a directory of business telephone numbers, so that you can save yourself the time and effort of calling information. If you dial from your computer, it will keep a record of your calls.

And, you can add a device called Watson (Natural MicroSystems Corp.; [617] 655-0700; \$48) to your IBM PC, which acts like a sophisticated telephone answering machine—except that it stores callers' voices to disk. In addition, Watson can be programmed to talk to callers, telling them to push 1 to place an order, 2 to hear credit terms, and so forth.

7. Accounting. Businesses are based on numbers, and a computer can function as a glorified adding machine. In the planning stages of a business, you can use a spreadsheet to make projections. Later, you can use the same spreadsheet or a specialized accounting package to record accounts receivable and accounts payable, and to track inventory levels.


8. Mobility. In the old days, if you left your office for several days to make sales calls, you usually left all your files as well. These days, you can carry a laptop computer with a modem, and dial into your desktop computer at home. Just leave your desktop computer set up with communications software in REMOTE mode, and you will have access to all the files stored on your disk.

9. Filing. A Rolodex can organize names and numbers alphabetically. A computer database program can organize and retrieve names and numbers by profession, by city, by state, by last payment, by payments due, etc. In short, a properly arranged database allows you to cross-reference material in countless ways.

A computer with a hard-disk drive can also operate as a massive filing cabinet. Instead of going into the basement to retrieve a file on a client, you can call it up from your hard-disk drive. Since you can arrange your hard-disk drive by directory (such as RETAILERS) and sub-directories (such as MOM AND POP and MASS MERCHANDISER), you can quickly put your hands on data.

10. Research. With a computer and a modem, you have access to virtually all the professional and technical material that's being published these days. You can tap into specialized databases, such as Dialog and BRS, to get bibliographic abstracts or full-text printouts of important data.

Depending on your field, you can also subscribe to services that will give you demographic data on buyers of various products. Getting this information by computer means you get it quicker, and that you can manipulate and customize it for your needs.

—NICK SULLIVAN 

**THE MOST
IMPORTANT
FORM OF
FREEDOM YOU
WILL
EXPERIENCE ON
YOUR OWN IS
CREATIVE
FREEDOM.**

BUYER'S GUIDE TO HOME-OFFICE PRODUCTS

BY DAN GUTMAN

ADVANCES IN CALCULATORS, COPIERS, TELEPHONES AND TYPEWRITERS MAKE THE ELECTRONIC COTTAGE HUM

A dozen years ago, Paul Edwards was a full-time CEO for a corporation, and his wife, Sarah, was an administrator for a government agency. "We spent too many hours flying across the country, keeping tight schedules, and waving goodbye to each other in airports," they say. "We were smoking too much, sleeping too little, and leading ulcer-prone lives."

One day Sarah visited a colleague who worked at home and decided on the spot what she wanted to do. She and Paul started their own companies at home in 1975 and haven't looked back since. She works as a psychotherapist and he as a business consultant. Together they run CompuServe's Work-at-Home Special Interest Group, give seminars on working at home, and have written a book, *Working From Home: Everything You Need To Know About Living and Working Under The Same Roof* (Jeremy P. Tarcher, 1985).

They're not alone. According to Link Resources, a New York-based research firm, 43 percent of all personal computer owners use their computers for business or office work at home. More and more people are taking work home, "telecommuting" (working from home for a corporation several days a week), or starting businesses in their kitchens, basements, and dens. Eighteen million Americans do job-related work at home, according to a study conducted by the Bureau of Labor Statistics.

While computers themselves are often the inspiration for home-based businesses and the cornerstones of many home offices, the computer is not the only piece of business equipment you'll need. Much of the boom is due to computer technology in non-computer appliances. "The advent of the lower-cost photocopiers, typewriters, laser printers, and telephone answering machines is sparking the work-at-home market," says Joe Rotello, publisher of *The Home Office Newsletter* (THON), an electronic publication available on the GENIE network.

Manufacturers are sticking microchips into everything these days, so machines have more capability than before and cost a lot less. We're throwing out our old labor-saving devices and replacing them with computerized labor-saving devices that are faster, smaller, more powerful, and less expensive. As the price of high technology comes down, people can buy sophisticated office equipment that used to be available only to million-dollar companies. "The home office user now has the speed and power that was once totally reserved for the large office," Rotello claims.

A hundred years ago—in 1887—the automated office was just coming into its own. The typewriter had been on the market for 13 years, the telephone for 10. In one year, mimeograph machines would be available. With the

spread of electricity, complex machinery was revolutionizing the office.

Now it's 1987, and it's the microprocessor that's revolutionizing the office—and bringing it home.

Setting up a home office with state-of-the-art appliances is a lot less expensive than you might think, especially if you already have a working computer system. Here, we look at computerized office products in four major categories: typewriters, copy machines, telephones, and calculators. For each category we give a brief glimpse of the state of the art 100 years ago—and where we stand today. We cover products ranging from \$15 to \$2,500. Even the upper-end products can carry a relatively affordable price tag if the product does what you want and you can count it as a business expense.

With these products, your home office, electronic cottage, office away from the office, or whatever you call it, can be run more efficiently.

TYPEWRITERS

FROM ELECTRIC TO ELECTRONIC

In 1872, Christopher Latham Sholes's original Type-Writer had its letters arranged in alphabetical order on a keyboard that resembled a piano keyboard. The keys were suspended by wires in a circular nest inside the machine. The Type-Writer printed only capital letters, and the operator couldn't see the paper he or she was typing on. Typewriting didn't really catch on until permanent ink was invented in 1885.

Today, though most people prefer computers for writing, most also believe that it's still easier to address envelopes and write short notes on a typewriter.

A few years ago, it was widely assumed that computers would make typewriters obsolete. Typewriter sales dropped 16 percent from 1981 to 1983, when the full rush of the computer boom was under way. But, to paraphrase Mark Twain, reports of the typewriter's death have been exaggerated. (Twain, by the way, was the first author to write a book with a typewriter.)

It's true that manual typewriters are long dead; and electric typewriters are freshly killed. But, the new typewriter is electronic. "Of the 2.6 million typewriters sold in 1986, about 60 percent were electronic," says Fred Feuerhake, vice president of marketing at Smith Corona, which just had its best sales year in its 100-year history. Because the industry is changing with the times, typewriter revenues overall went up 25 percent last year, according to *Business Week* magazine.

Electrics were essentially manual typewriters that used electricity to give the keys a shove. Electronic typewriters are built around a microchip, so they're not mechanical in nature. They're quieter, cheaper, more reliable, cost less to build, and use less energy. The big difference comes down to the number of moving parts. The old IBM Selectric has about 2,500. IBM's new Wheelwriter has about 700.

Because the undeniable pleasure and efficiency of word

DAN GUTMAN, who wrote "The Customized Computer" in the July 1985 issue of *FAMILY COMPUTING*, is the author of *I Didn't Know You Could Do That With a Computer!* (Compute! Books). He works out of a home office with his personal computer, telephone answering machine, and personal copier.

**Smith Corona PWP
(Personal Word
Processor)**



**Smith Corona
XD 8000
electronic typewriter**



Magnavox Videowriter



Epson Elite 400

processing has forced the typewriter to change, the new machines blur the line between typewriting and computing. Your next typewriter is likely to have a screen that will let you proofread a line, or a whole page, before you print it. It will center words on the page, underline them, boldface them, give them straight margins, and put them in different typefaces. When you near the end of the page, the typewriter will beep, and it will print out another copy of the same page while you go grab a snack.

Spell-Check Typewriters. Typewriters aren't dumb anymore. Royal's Alpha 605 (\$480) comes with Merriam Webster's 80,000-word dictionary built-in. Panasonic boasts an 86,000-word dictionary in its RK-T55 (\$600), as well as credit-card-sized floppies that store 8,000 characters in memory. Silver Reed's 89SP (\$349) has the largest dictionary we've seen yet—90,000 words. Plus, it has a

4,000-character memory.

Now, typewriters not only check your spelling, they even help you with your English. Epson's Elite 400 (\$550) comes with a built-in 35,000-word thesaurus. It also features an LCD calculator and a calendar that can display months and years up to 1999.

To show how easy correcting errors has become, look at Smith Corona's XD 8000 (\$559). For starters, it has a 75,000-word dictionary and beeps immediately when you make a typographical mistake. It also beeps if you forget to capitalize the first word in a sentence. If you're not sure how to spell a word, just type a few letters and hit the LIST key. The LCD display shows all the words in the dictionary that begin with those letters. If you make an error, just hit the WORDERASER key and the last word is lifted off the page.

Even more remarkable, the XD 8000 gets to know your typing personality. For example, if you frequently misspell *accommodate*, the typewriter will instantly correct you. So it not only tells you that you made an error, it provides the correct spelling, eliminates the wrong word, and types in the correct word.

Remember the Selectric? Remember when the "golf ball" inside the IBM Selectric was so revolutionary? Until recently, every office was filled with Selectrics. Today, IBM is phasing out the 25-year-old classic in favor of their new Wheelwriter and Quietwriter systems. The more advanced "intelligent typing systems" use snap-in cartridges to expand memory and have complete word processing capability. And, the Quietwriter silently electronically "paints" the letters on the page instead of slamming the keys against the platen.

Dedicated Word Processors. According to market researchers, upwards of 80 percent of IBM and Apple computer owners use their computers primarily for word processing. For people who want more than a typewriter, but feel a computer is overkill, there are dedicated word processors. For first-time users, word processors are generally easier to learn than computers.

Typically, dedicated word processors—such as Magnavox's Videowriter (\$799) and Amstrad's Word Processor (\$499)—include keyboard, monitor, printer, and disk drive. However, the printer won't give you typewriter-quality results, and you won't be able to choose the kind of paper you insert. Smith Corona's PWP (Personal Word Processor; \$599) comes without a printer and is designed to be attached to a Smith Corona typewriter.

Of course, if you ever want to do graphics, spreadsheets, telecommunications, or sample any of the other joys of computing, you'll be out of luck. Dedicated word processors cannot be expanded.

PERSONAL COPIERS

GETTING SMALLER AND LESS EXPENSIVE

Disgusted at having to write 50 letters a day, Chicago lumberman Albert Blake Dick hit on a solution. He placed a stiff wax stencil into a wooden frame and wrote on the surface with a stylus. Then ink was applied to the stencil with a roller and squeezed through onto another sheet of paper. On March 17, 1887, he sold his first Mimeograph machine. *Mime* meant *copy*, *graph* meant *write*, and *o* gave it "the swing," according to A.B. Dick.

Since then, duplicating machines have come a long way. The old blue-ink mimeograph machine has virtually disappeared, and the giant photocopy machine (invented by Xerox in the 1950s) that was once affordable to only the largest corporations can now be found on desktops in home offices. The appreciation of the yen nudged up prices of Japanese products recently, but personal copi-

Sharp Z-70 compact copier



Sharp Z-HC1 "Handy Copier"



Canon Personal Copier

ers (virtually all Japanese-made) have come down drastically in the last few years. You can now buy a desktop copier for less than \$500.

Handhelds. Copiers seem to be copying the evolution of calculators. They started out filling small rooms, then they could fit on a desktop, and this year you can actually hold one in your hand! Silver Reed's Porta Copy (\$350) is about the size of a paperback book and weighs less than four pounds. When you slide it over a page, it spits a 3.2-inch wide photocopy out the other side. It's perfect for work on the road, making records of checks, and copying articles from newspapers, magazines, and books that you don't want to cut up.

Sharp's Handy Copier (\$180), just introduced, works much the same way, and even has a zoom feature that magnifies copies to twice the size of the original.

Desktops. The photocopy machine is about to become a home appliance, or so it appears. Canon's Personal Copier Family is affordable (\$695-\$1,595) and quite friendly. A cartridge contains everything that can run out or wear out, so you can replace the innards as you would a roll of film in a camera. One cartridge will print 1,500 copies, according to Canon.

The low-cost Canon machines make eight copies a minute and do elementary reduction. The beginner model, the PC-10, can hold only one piece of paper at a time; the others (PC-14, PC-20, PC-24, and the PC-25) can hold from 50 to 100 sheets, and print up to 19 copies. The top two models are capable of reduction and enlargement and can copy business cards. The Sharp Z-50 (\$799) and Z-70 (\$1,299), print up to 19 copies at a time. The Z-70 also reduces and enlarges.

If you have more sophisticated copying chores, you'll be looking at slightly more expensive machines by Mita and Toshiba. These machines include *Auto-Duplexing* (automatically flipping your copy to make two-sided copies from one- or two-sided originals) and *Zoom* (enlarge an image in 1 percent increments).

The next innovation for home offices will be color copying. It's available now, but quality is still poor and prices are high. Give it a few years.

When comparing copiers, consider not just image quality, but also warm-up time, ease of servicing, noise level, the cost of supplies, and the size of your copies. Datapro Research Corp. (1805 Underwood Blvd., Delran, NJ 08075; 800-DATAPRO) publishes an annual report called "User Ratings of Copiers" (\$30), if you want to thoroughly research your purchase.

TELEPHONES

YOU CAN EVEN TALK ON THEM

In 1860, 16 years before Bell called Watson, a professor at the University of Frankfurt named Johann Philipp Reis publicly demonstrated a telephone. A violin case served as a resonator, a hollowed-out beer barrel made the mouthpiece, and the diaphragm was made of stretched sausage skin. The device transmitted recognizable music 300 feet, but speech could not be understood.

Today, dialing a number and speaking to someone is only one of dozens of things you can do with a telephone. Since the 1983 FCC ruling that individuals could own their telephones, a host of companies have jumped into the business and pushed the telephone to new heights.

These days, phones that don't have memory are the unusual ones. Southwestern Bell's Freedom Phone FD-8000 (\$180), for example, stores more than 100 phone numbers, any of which you can speed-dial.

Phones For the Road. Some phones make it even easier for you to dial. Instead of having to remember that button #14 is your friend Bob, with Colonial Data Technologies' AP2002 (\$180) you just punch in the letters B, O, and B, and the phone automatically dials Bob's number. CDT calls it *name-dialing*.


The same company makes a calculator-sized dialer called Directory Dial Mate (\$80). When you're on the road or in an airport, you simply hold it up to the phone mouthpiece like a beeper and it generates the tones to dial any touch-tone phone in the world. You can program in 200 numbers.

In fact, with some phones you don't even have to dial at all. Voice Dialer (\$199), from Innovative Devices, uses speech-recognition technology. Calling your business partner is as easy as picking up the phone and speaking his or her name. AT&T's model 1280 cellular car phone (\$1,745) works the same way, so a driver can dial without looking away from the road. Look Ma Bell, no hands!

Most office telephones now have speakers, so you can hold a conversation without lifting the handset. It's not unusual to see phones with LCD displays that indicate the number that you dialed and other functions. Code-A-Phone's Model 8400 series (\$140-\$190) uses the display to show you how many minutes you've been on the line.

One helpful feature is last-number redial. When you get a busy signal, you can dial the number again by pressing one button. GTE's 7400 (\$200) features *BusyDial*. When you get a busy signal, the telephone will dial the same number 10 more times, by itself.

Two-line Phones. Many phones now come with two lines built in. If you use a modem for data calls, you can still keep a line free for voice calls. Or, if you're on one line, the other line will ring. You can then put the first caller



**Code-A-Phone
Model 8440**

Canon FaxPhone 10

**Southwestern Bell
Freedom Phone**

Luma Telecom's video phone

on hold, and pick up the second line. Without such a feature, you run the risk of alienating business callers who get frustrated with busy signals.

Panasonic's KX-T3204 (\$85) has two lines and you can answer either one when the other is in use. You can also conduct conference calls on both lines. For those on the move, Code-A-Phone's The Model 2597 Call Diverter (\$595) will automatically transfer your incoming calls from one location to any phone number you select.

Telephone Answering Devices. A few years ago, people were annoyed when a machine picked up the phone instead of a human being. Today, we get annoyed when humans don't have a telephone answering device (or *TAD*, as it's called in the business). We almost expect to chat with answering machines now, and I wonder how many people would rather leave a message than have to continually re-dial the number.

The latest wave of TADs are easier to use and friendlier than the older multibutton monsters. Code-A-Phone's 3500 series (\$150-\$200), for instance, features one-touch message playback. You just press *PLAY* and the machine rewinds the tape, plays back your messages, and resets itself for the next call.

Some answering machines may even be integrated into the telephone itself. They not only tell you who called, but also record the time and day each message was received. Moreover, your callers will no longer be cut off in the middle of their messages—the answering machine is programmed to keep taping as long as a caller keeps talking. You can also use the machine as a tape recorder to record personal memos or your phone conversations.

If you have GTE's 7130 (\$115), you can even forget to

turn the machine on when you leave home. Its *Remote Turn-On* feature allows you to ring your phone 10 times from a remote location to activate the answering machine.

Like some stereos and televisions, answering machines are going digital. Sharp's FP-700 (\$220) encodes your outgoing message into an integrated circuit, so there's no rewinding and no waiting. CDT's Voice Messenger (\$60) goes one step further—it doesn't have a single moving part!

Facsimile Phones. For years, newspapers have been using facsimile (or *fax*) machines to send documents, drawings, and even photographs over telephone lines. Until recently, the cost of fax machines was between \$10,000 and \$30,000. But now faxes fit into attaché cases and are affordable even to business-minded consumers.

The facsimile machine is really a merging of the copier and the telephone. With Canon's FaxPhone 10 (\$1,995), you simply punch in the phone number of the fax you're sending to (the other end must have a G-3 fax machine). Then slide your original document into the machine. A duplicate pops out of the other fax machine 17 seconds later. FaxPhone also includes a copier.

Facsimile phones are also made by Sharp (FO-200; \$1,895), Xerox (Telecopier 7010; \$2,495), and Toshiba, among others.

Video Phones. Ever since AT&T demonstrated its experimental Picturephone at the 1964 World's Fair, cutting-edge types have been waiting for the day they could reach out and see someone. Unfortunately, full-motion video signals contain 2,000 times as much information as voice signals, and the technology has simply been too expensive for homes and all but the biggest businesses.

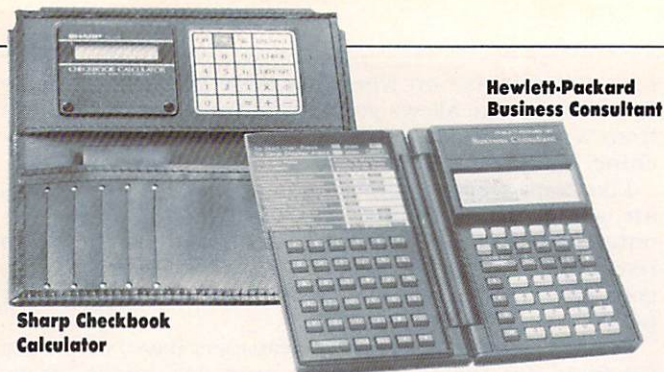
However, Luma Telecom is undeterred. Their Luma (\$1,450) is a visual telephone that sends black-and-white still photos over existing phone lines in about three seconds. The unit has a built-in video camera and a small monitor that displays your image on the right and the person you're calling on the left.

Luma and other video telephones will be used mostly for surveillance at the start. Doctors will be able to watch patients. Detectives will be able to send mug shots of criminals across state lines quickly. In fact, if you look closely at "Miami Vice" this season, you'll spot Luma as a permanent fixture in the squad room.

Although today's telephones are marvels of technology, they don't always stick to the *KISS* principle ("Keep It Simple, Stupid"). While the computer manufacturers are trying to make their products as easy to use as a telephone, many of the new telephones are becoming as confusing to use as computers. Look for durability and reliability in a phone. When shopping for one of these fancy phones, don't forget the most important high-tech feature of all—a clear voice on the other end of the line.

COMPANIES

Apple, (408) 996-1010; Amstrad (distributed by Sears), (800) 222-0223; AT&T, (201) 898-8338; Canon, (516) 488-6700; Casio, (201) 575-7400; Citizen, (800) 421-6516; Code-A-Phone, (503) 655-0132; Colonial Data Technologies, (203) 355-3178; Epson, (213) 539-9140; GTE, (203) 965-2711; Hewlett-Packard, (415) 857-1501; IBM, (914) 765-1900; Innovative Devices, (408) 984-1616; Langenscheidt, (718) 784-0055; Luma Telecom, (408) 970-9555; Magnavox, (615) 521-4316; Mita, (201) 288-6900; Mitsubishi, (312) 860-4200; Panasonic, (201) 348-7000; Radio Shack, (817) 390-2728; Royal, (203) 683-2222; Seiko Instruments, (213) 530-8777; Sharp, (201) 529-8200; Silver Reed, (213) 516-7008; Smith Corona, (203) 972-1471; Southwestern Bell Telecom, (314) 822-6981; Texas Instruments, (800) TI-CARES; Toshiba, (714) 730-5000; Xerox, (800) 527-6200.



Hewlett-Packard
Business Consultant

Sharp Checkbook
Calculator

CALCULATORS

NEW USES ARE MULTIPLYING

Charles Babbage's Difference Engine could multiply or divide any pair of numbers in about three minutes. It was powered by a steam engine and contained six vertical axles, pins, springs, toothed gears, and a hand crank.

THE FUTURE HOME OFFICE

A day in the Life of Techno-Man/Woman

Someday our high-tech computers, typewriters, copy machines, and other office equipment will seem quaint and primitive, the way the office equipment of 1886 seems to us today. Of course, it's impossible to predict the kinds of office machines and gizmos we'll be using in the 21st century, but we can try...

Techno-Man slides behind his fallout-proof desk module. Thank God it's Friday! The macro lens photographs the retina in his eye to confirm his identity and the whole LCD desktop lights up for the day. A duplicate screen hangs on the wall like a picture frame. When he's not using it, it shows a Matisse print.

Techno-Man pops a disk labeled "N.Y. Public Library" into a slot on the desktop. It doesn't contain the library card catalog; it contains the whole library. At his voice command, book pages and research materials appear on the desktop screen. Techno-Man can move the simulated documents around by touching their images with his fingers, and he can press a button to send a copy of any page electronically to any desktop in the world.

The paperless office is finally a reality—all the trees were used up decades ago.

Techno-Man then reads the mail off the desktop screen and dictates a few replies. The desk automatically codes his speech into data and word processes it into business-letter format. Techno-Man signs each one with his distinctive TM on the surface of the desk with his laser stylus.

A soft tone indicates someone wants to take a meeting. "I hate holographic conference calls," he mutters to nobody in particular. As it turns out, it's Tom Sugiyama in Kyoto. Techno-Man plugs in his brain wave receiver and rings up Sugiyama's extension. They trade industry gossip telepathically, with Techno-Man thinking in English and Sugiyama thinking in Japanese. AT&Toyota handles the translation.

After a few minutes of small talk, Sugiyama suggests, "Let's have lunch." Techno-Man agrees and hops on the next Orient Express, which arrives in Japan two hours later. After dining, Techno-Man and Sugiyama inspect the firm's new factory, which was built by robots and run by robots, and manufactures robot servants that will be purchased by other robots. Everything's running smoothly, though Sugiyama is forced to dismiss one Fifth Generation computer whose artificial intelligence has evidently gone to his head.

Then it's back to catch the afternoon shuttle to Central Park Airport. Techno-Man returns to his office to see that his desk has already completed the afternoon's work without him, and is killing time by throwing heat-seeking auto-darts at the wall.

"Good," nods Techno-Man. "I might as well knock off early and take the kids to LucasLand." He reconsiders and decides they'd prefer a trip to the new EPCOT museum (Examples of a Primitive Civilization's Obsolete Technology) in Florida, which just reopened for the Tricentennial. As he strolls out the door, his robotic receptionist winks and asks, "Half-day, TM?"

—DAN GUTMAN

Babbage never completed it, and was working on it when he died in 1871. The finished Difference Engine would have stood 10 feet high and weighed two tons. Not exactly something you'd slip into your shirt pocket.

A by-product of the space program, electronic calculators were a sensation when they hit the streets in 1971. For about \$500, you could do simple arithmetic and a few trigonometric functions. Now manufacturers are practically giving away calculators like prizes in cereal boxes.

Calculators are really computers, and they're starting to look the part. Newer machines feature backspace keys, two-color printing, and keyboard buffers that allow you to enter digits while the printer is working on its last calculation. You can add memory chips and hook up plotters, modems, disk drives and bar-code readers. Ten years ago, who would have thought we'd be reaching for our credit cards and pulling out calculators by mistake.

The new calculators are smaller, smarter, and more versatile. The trend is away from all-purpose calculators and toward number crunchers that specialize in applications for a specific audience.

Financial. The Texas Instruments Business Analyst-III (\$65) contains preprogrammed formulas for financial, cash flow, cost-sell margin, markup, and statistical problems. It will calculate a balloon payment schedule for you or work out a negative amortization problem.

Hewlett-Packard's Business Consultant (\$175) makes it easier to solve financial equations in English. You just punch in an equation such as $PROFIT = (PRICE - VARCOSTS) \times UNITS - FIXED COSTS$. Then you enter the known values, and the calculator solves for any variable. You can print out your results on a small cordless printer that communicates with Business Consultant through an infrared light beam. Booklets are available that show how the machine can be used in marketing, sales, investments, real estate, and banking.

Checkbook. Royal's CBC80 checkbook calculator (\$16) will hold a record of your checks and help you calculate your balance as you write them. And just to make sure nobody peeks at your accounts, you can program in a four-digit password, which must be punched in before the calculator will tell you anything. Citizen's CBL-200 (\$16) has a similar feature which they call the "Citizen Security System."

Scientific. Texas Instruments' TI-60 (\$45) Scientific Calculator is made for people who need to calculate linear regression and trend line analysis. It offers 107 functions and can use hexadecimal and octal notation and convert measurements from metric to U.S. standards and vice versa. The TI-95 Procalc (\$200) will even do windows, up to five in the 31-character display.

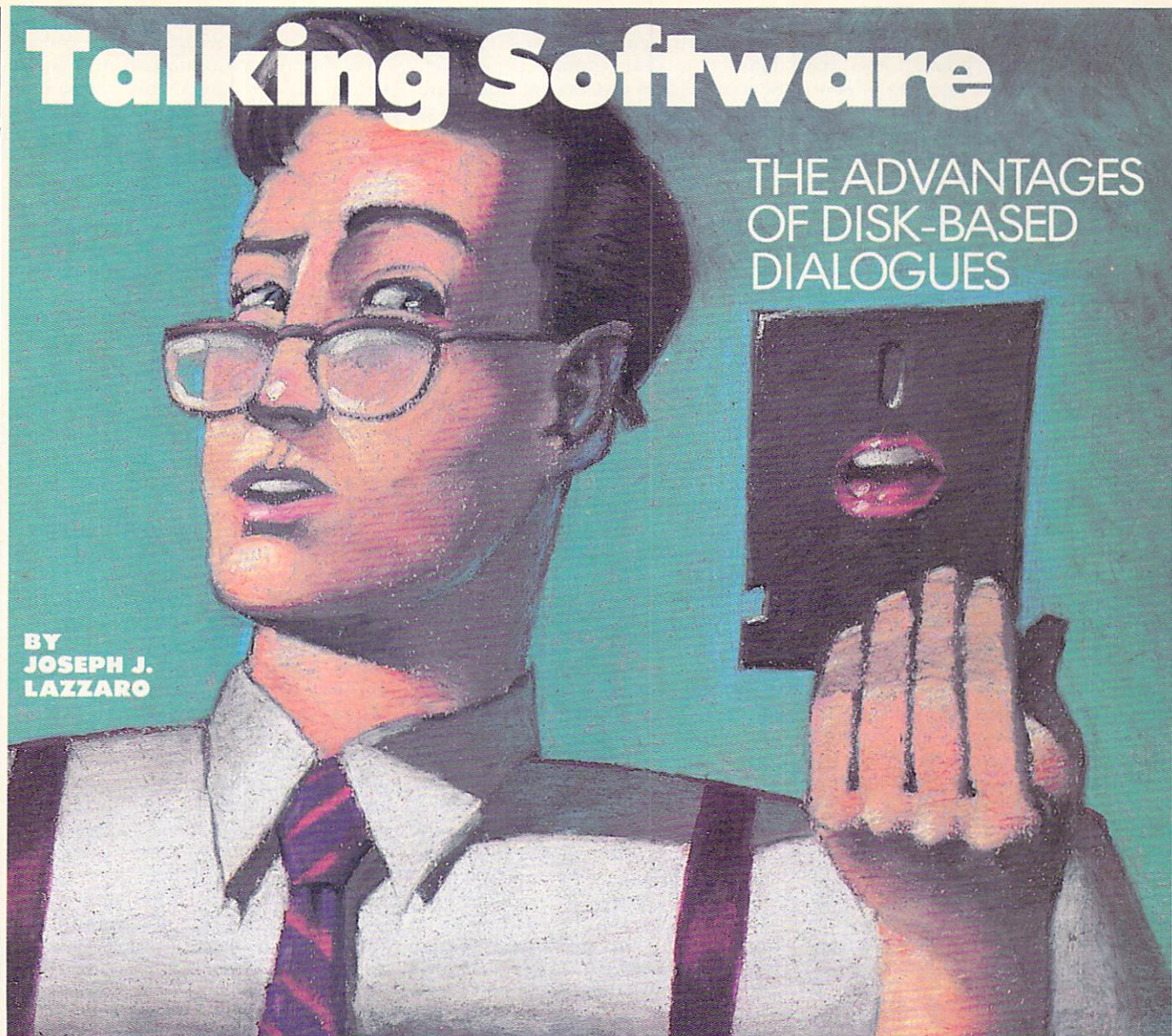
Hewlett-Packard's HP-IL (\$295-\$395) allows a salesperson or scientist to gather information in the field on a calculator and transfer the data into a computer. The Casio FX-7000G (\$80) even plots numerical equations as bar charts.

Calculators that just calculate are old news. These days, they'll do everything but fold your socks. Seiko Instruments' Day Filer (\$100) is an electronic appointment book for quick scheduling. For travelers, Langenscheidt's Translator-8000 (\$70) will translate 4,000 English words into their French, Spanish, or German equivalents. In the specialty stores, you'll see calculators with such unlikely names as Thoroughbred Horse Race Analyzer, Personal Golf Computer, The Electronic Bridge Scorepad, and everyone's favorite—French Food and Wine Computer (which will tell you what type of Bordeaux goes best with shrimp). Who knows when you'll have to impress a client with your *savoir faire*? **FC**

Talking Software

THE ADVANTAGES OF DISK-BASED DIALOGUES

BY
JOSEPH J.
LAZZARO



Talking computers were once the realm of such science-fiction thrillers as *Star Trek* and *2001*, but they aren't make-believe any more. At this moment, computers with powers of speech are being used by students, business people, and the blind or visually impaired.

WHY DO COMPUTERS NEED TO TALK?

For people who have problems seeing, the benefits of speech synthesis are fairly obvious. Without it, their only access to computers would be based on expensive braille printers or monitors with extremely large print. Speech is the only inexpensive alternative, giving them the same com-

puting power as the sighted. "I wouldn't be able to do my job without my computer," said Albert Gayzagian, director of corporate analysis at John Hancock Insurance. He uses a talking IBM PC to do financial forecasting for the insurance giant. "I like the fact that I can run any program with the voice output, and it makes me as competitive as my sighted co-workers."

"Talking software can be very valuable because of its audio/visual implications," said William Davey of *Closing the Gap* ([612] 248-3294), a newspaper for computer users with special needs. "Children and adults with learning or reading problems use talking computers to reinforce the written word, providing both sight and sound at the same time." In the case of dyslexic people, word or letter scrambling can present a diffi-

cult problem. "The speech 'unscrambles' the text," continued Davey, "and helps them more easily recognize words."

That's true for all kids learning to read and write. For instance, *Talking Text Writer* is a word processor designed for use in both schools and homes. It's been proven that verbalizing words makes them easier to read, and encourages kids to write.

The sighted are also using talking software on the job. One example is *SpeechWorks*, a program that turns *AppleWorks* into "a talking multi-tasking program, incorporating verbal confirmation of keystrokes," said Randy Carlstrom, whose company, RC Systems, publishes it. "*SpeechWorks* is not intended for the blind, but rather the serious *AppleWorks* user who wants to increase productivity."

JOSEPH J. LAZZARO works in Watertown, Massachusetts, as a writer and computer consultant specializing in speech systems.

YOUR CHOICES IN MAKING A COMPUTER TALK

Because of their greater age, the Apple II and IBM PC families of computers (and, to a lesser extent, the C 64/128 duo) boast the bulk of talking software packages. But these machines all need extra hardware, either an internal card or an externally attached box, before they can begin to talk intelligibly. (NOTE: See "Computer Conversations" in the November 1986 issue.) Newer computers with superior sound chips—including the Amiga, Apple IIGS, Atari ST, and Macintosh—don't need extra hardware to produce clear speech. And now more talking programs are becoming available for these machines.

In either case, your computer still needs special software to make it talk. There are two basic approaches to take—you can purchase a custom program that's designed to talk, or you can get a screen reader, a program that makes other programs talk (mainly on MS-DOS computers, however).

A screen reader (also called a speech driver) turns an ordinary PC into a talking computer by opening a permanent pathway between the computer's screen and keyboard and the speech-synthesis hardware. By providing complex rules that turn letters of the alphabet into their appropriate sounds, screen readers can make most software packages talk without modification. A screen reader gets its information directly from the part of the computer's memory that produces text on the screen. A copy of this text, minus special formatting commands, is piped directly to the synthesizer. After the screen reader is started, almost any program can be run on top of it, including such popular packages as Lotus's 1-2-3, *Word Perfect*, or *dBase III*.

Custom talking programs—such as some word processors and data bases—are designed specifically to run with various speech synthesizers. They can also be used by the sighted since they still use the video screen. These special programs are usually less difficult to operate than screen readers because they "talk in immediate mode." This means that as the screen fills with text, the speech synthesizer speaks every line.

Even though they're not as powerful as the combination of screen reader and off-the-shelf software, custom talking programs are easier for the blind to use with a speech synthesizer as the only source of information. That's because most regular pro-

grams are highly visual and paint the screen with text boxes and graphics characters that cannot be spoken. Screen readers also do not talk in immediate mode with most programs; you must enter a "review mode" to read the screen after it has filled with text.

TYPES OF TALKING PROGRAMS

Word processors. Almost a decade ago, word processors were among the first talking software products to be developed, and these became treasured among blind users. "My computer is like my right arm. Using a talking word processor, I can write independently, without assistance," said Mindy Fliegelman, a blind computer consultant from New York City. She uses IBM and Apple computers with braille, large print, and speech systems to train legally blind persons for the state of New York.

The best talking word processors have features to turn off certain regions of the screen. For example, most have a character counter that keeps track of document size. So if you type "cat," you will hear "C1, A2, T3." However, if you declare the counter as verbally inactive, you will hear only "C-A-T" as you key in the word.

As the word processor talks, the screen is also active. All characters typed are visible, and any text currently displayed can be voiced by moving the cursor to the desired characters. When proofreading time comes, the text can be read back by the letter, word, line, or page. Punctuation, capitals, and other special symbols can also be spoken.

For example, *Word-Talk* obeys punctuation marks, raising the pitch of a word if it is followed by a comma, or lowering the pitch if it is followed by a period—much like normal human speech patterns. With this feature, you can more easily proofread your work and detect bad sentence structure.

Data bases. A data base that talks allows you to perform normal filing functions (such as searching for a record) with verbal input and output. For example, when you create a data base with *File-Talk*, the computer talks you through all the steps, such as "ENTER FILE NAME." As you type in data, each keystroke is announced. *File-Talk* verbally helps you design a blank form by speaking, "ENTER NAME FOR FIELD #1 . . . FIELD #2," and so on.

Spreadsheets. You can instruct a talking spreadsheet to speak numbers either as words or as individual

digits. For example, the amount \$101.03 can either be pronounced as "one hundred one dollars and three cents" or as "dollar one zero one point zero three." When you use *Rap-sheet* (a shareware talking spreadsheet), the program announces cell positions—"A1, A2, A3"—as the cursor keys are pressed. If you want to hear the contents of a cell, a single keystroke brings the voice synthesizer to life: "Total amount due is fifty dollars."

Sighted data-entry operators also find talking spreadsheets (and data bases) useful, because the verbal feedback allows them to work faster and with greater accuracy. Since many people are fearful of making numerical errors, a talking application can provide a "safer" means of data entry.

Communications. The time has come to call the university's computer and to read your electronic mail. You type the telephone number, and the speaker verbalizes each digit. An electronic ringing pulsates from the computer. Then the speaker says, "Welcome to the University of Massachusetts VAX Cluster Network." You key in your secret password, but the program knows enough not to utter this confidential code. It only says, "Last interactive log-in on Wednesday, 1-April-1987. You have four new mail messages." This isn't the movie *War Games*, but a typical talking terminal program.

As far as the remote computer is concerned, it is communicating with another screen-based terminal, not with a talking computer. These programs have special benefits for blind or partially sighted users, since they allow access to a wealth of information. This is important, because the blind have been traditionally removed from printed material. Also, relationships made on-line are not biased by the uneasiness that blindness sometimes produces in the sighted.

Educational software. "A computer equipped with a voice synthesizer is the ultimate teaching aid," said Sandy Smith of Perkins School for the Blind in Watertown, Massachusetts. "Our kids are doing their book reports in their spare time, and the assignments aren't due for six weeks."

There are numerous talking educational programs, useful in school or at home for blind, "special ed," and mainstream students. Many of these programs employ speech mixed with graphics or text and teach math, foreign language, science, history, reading, grammar, and other skills.

MORE TO COME

The history of talking computers began when Homer Dudley demonstrated his Synthetic Speaker at the 1939 New York World's Fair. As a result of pioneering work like his, commer-

cially available speech synthesizers have dropped radically in price. It is now possible to equip a microcomputer with a voice synthesizer for under \$100. As this trend continues, we can expect speech systems to get even

cheaper and better—especially with the growing popularity of the Amiga, Atari ST, Macintosh, and Apple IIGs. Keep your ear close to the ground for new developments that are coming soon. **FC**

A SELECTION OF SOFTWARE THAT TALKS

Talking programs for the Amiga, Apple IIGs, Atari ST, and Macintosh do not require extra speech-synthesis hardware.

SCREEN READERS

Screen-Talk-Pro (CAC). IBM PC/PCjr. Requires Echo GP. \$395.

This screen reader comes bundled with the *Prokey* macro program. This means user needs fewer keystrokes to control both the host software and the screen reader. Works in real-time with up to 10 user-definable windows.

SmoothTalker (FBY). Amiga, Atari ST, Macintosh. \$50.

Converts any text document into spoken words. Works with files from *MacWrite*, *Microsoft Word*, and any other programs that can create text files.

Soft-Vert (TSS). IBM PC. Requires Echo PC, Votrax. \$395.

Screen reader that verbalizes all input and output, reading any character, word, or line, including highlighted or color text. Talks menu screens, help screens, and DOS prompts, making it versatile for use with most programs. Vert stands for Verbal Emulation in Real Time.

Verbal Operating System (CON). IBM PC/PCjr. Requires DecTalk, Echo, Votrax. \$550.

Speaks highlighted or inverse text. Capable of working with most commercial software packages. One of the most popular screen readers, known for its low memory consumption.

PRODUCTIVITY

Calc-Talk (CAC). Apple IIe/IIc. Requires Echo, Cricket. \$75.

In addition to regular spreadsheet features, offers exponential functions, trigonometric functions, and common and natural log functions. One-inch-high screen display. Works with or without speech. Aimed at students or business applications.

Checkbook (SFX). Apple IIe/IIc. Requires Echo, Cricket. \$60.

Includes storage and retrieval of checking or charge account data. Writes and prints checks; works with either standard or raised-line checks. Also addresses envelopes. Includes print documentation; braille or cassette manual available.

File Box (SFX). Apple IIe/IIc. Requires Echo, Cricket. \$25.

Simplified address book features up to six fields of data, a search function, and the ability to address envelopes. Prints entire files or just labels.

File-Talk (CAC). Apple IIe/IIc. Requires Echo, Cricket. \$195.

Supports memory expansion cards, and can store hundreds of records. Search speed is about 500 records per second. Can speak every keystroke, and can read records back by the letter, word, line, or page.

MaxiPlan (INT). Amiga. \$149.

A spreadsheet that can speak individual keys on input, and can select a range of cells to be read aloud. Can also speak numbers as words and can read data that has scrolled off the current screen.

ProTERM Plus (MTK). Apple IIe/IIc. Requires Echo, Cricket. \$195.

Features Xmodem file transfers. Can voice all keystrokes and screen text, and can automatically log onto any remote computer. Bundled with print, cassette, and disk-based manuals. The *ProWORDS* word processor, which works with *ProTERM Plus*, can be purchased along with the terminal program for \$375.

ProWORDS (MTK). Apple IIe/IIc. Requires Echo, Cricket. \$195.

Quick and easy editing of large documents. Compatible with *ProTERM Plus* (see above), *Word-Talk*, and other word processors.

Qwerty (HFK). IBM PC. Requires Echo GP or PC, Votrax. \$99.

A word processor that emulates a standard typewriter format. Easy to use.

Rapsheet (CAC). Apple, IBM PC/PCjr. Requires Cricket, Echo, Free.

A shareware spreadsheet, which users are free to copy for friends. If you find it useful, you are encouraged to pay a \$35 fee, which entitles you to complete documentation, an audio cassette tutorial, and the latest version of the program. Can speak all keystrokes, all cell entries, and whole columns.

SpeechWorks (RCS). Apple IIe/IIc. Requires SlotBuster II. \$190.

This utility "patches" your

copy of *AppleWorks* to make it talk. Requires the same company's card. However, in addition to an unlimited vocabulary speech synthesizer, the card also gives you a serial and a parallel port and an optional 64K print buffer.

Talker (FIN). Amiga, Macintosh. \$70.

A talking word processor that lets you hear what you type letter-by-letter, word-by-word, or by each sentence. With both male or female and natural-sounding or robotic voices.

Talking Transend (CAC). Apple IIe. Requires Echo. \$195.

Powerful system for on-line communications, with over 100 menu screens. Can upload and download text or computer programs to and from any computer system. Speaks every keystroke, and can also read the screen.

Word-Talk (CAC). 128K Apple IIe/IIc, 256K IBM PC. Requires Echo, Cricket. \$195-\$245.

Menu-driven word processor, featuring full voice output, block movements, global replace, and much more. Reads or deletes by characters, words, lines, or paragraphs. With print and audio cassette manuals.

EDUCATIONAL

KidTalk (FBY). Amiga, Apple IIGs, Atari ST, Macintosh. \$50.

A simple, talking word processor for children ages 3-13. Type letters, words, sentences. Also available from First Byte: *MathTalk* (basic number skills for ages 5-12), *Speller Bee* (with tutorials, tests, and word games for ages 5-13), and *First Shapes* (geometric shapes and problem solving for ages 3-13); \$50 each.

Kwik Speak 1 (EDM). Amiga. \$47.

Teaches Spanish orally, and can voice words and phrases from selected lessons.

The Orator (QUC). Amiga. \$40.

A "speech processor" in which you enter text in English, and the computer talks back. Lets you adjust the voice quality, rate, speed, pitch, etc. Offers both male and female voices. The program also uses phonemes to achieve customized speech effects that can be called up from an applications program; aimed mainly at hobbyists and programmers.

Reader Rabbit (TLC). Apple IIGs. \$50.

A new speaking version of an old favorite that earned a FAMILY COMPUTING Critics' Choice award. With four games that teach beginning reading, spelling, and vocabulary. For ages 5-7.

The Talking Coloring Book (JMH). Amiga. \$30.

Shows the word and the color, then speaks the color's name. Practice section uses speech to help kids identify nine different colors. The draw option lets the user draw a picture, and also prints it out. Kids learn to recognize the basic colors as they have fun creatively. For ages 4-8.

Talking Teacher (FIR). C 64/128. \$40.

Teaches elementary printing and keyboard skills for basic computer literacy. Interactive and extremely enjoyable to play.

Talking Text Writer (SCH). 128K Apple IIe, Apple IIGs. Requires Echo. \$188 (with Echo).

A word processor that allows kids (ages 5-12) to type their work and get both visual and auditory feedback to help improve language skills.

PUBLISHER KEY

CAC: Computer Aids Corp. (800) 647-8255.

CON: Computer Conversations, (614) 924-2885.

EDM: Eclipse Data Management, (818) 840-8757.

FBY: First Byte Software, (213) 595-7006.

FIN: Finally Software Inc., (714) 854-4434.

FIR: Firebird Licensees, (201) 444-5700.

HFK: HFK Software Inc., (617) 259-0059.

INT: Intuitive Technologies, (714) 999-6710.

JMH: JMH Software of Minnesota, (612) 424-5464.

MTK: MicroTalk, (502) 896-1288.

QUC: Quality Cottage, (219) 234-4401.

RCS: RC Systems Inc., (206) 672-6909.

SCH: Scholastic Software, (212) 505-3675.

SFX: Soft-X, (414) 445-5925.

TLC: The Learning Company, (415) 328-5410.

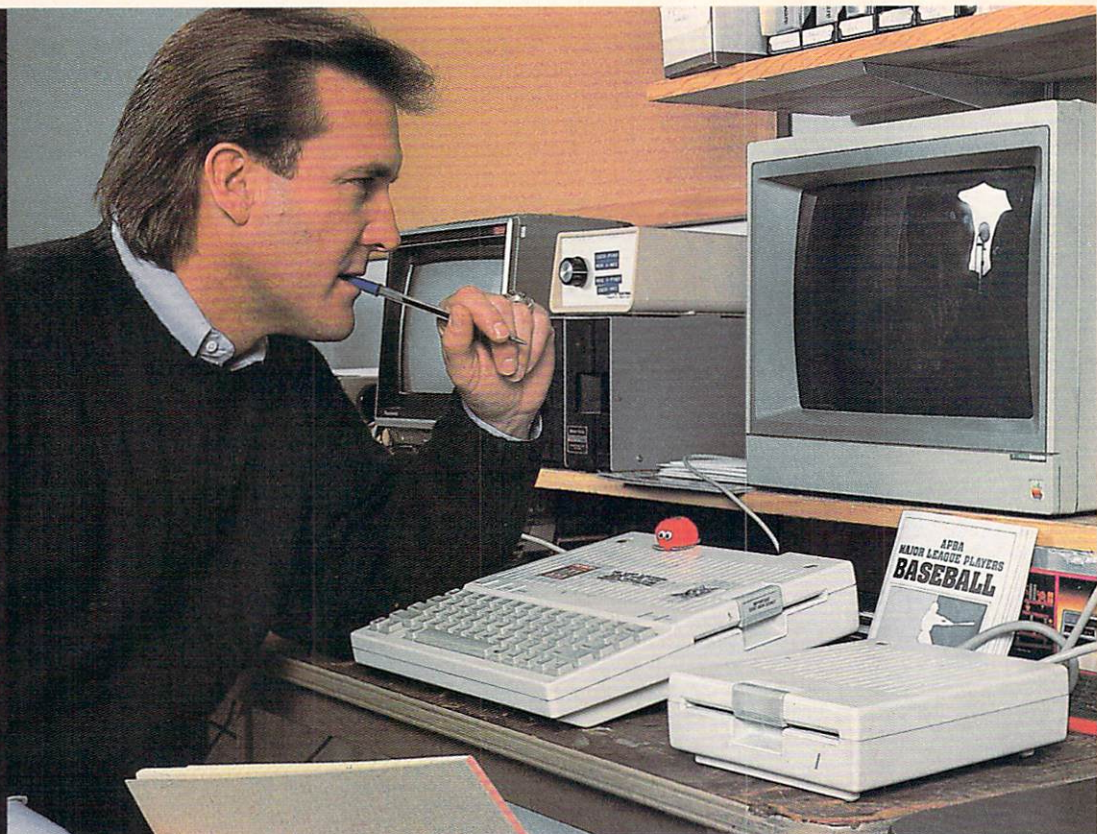
TSS: Tele Sensory Systems, (415) 960-0920 & (800) 227-8418.

OPENING DAY SPECIAL:

PLAY BALL!

A MAJOR-LEAGUER TALKS ABOUT COMPUTER BASEBALL GAMES

BY TUG McGRAW



PHOTOGRAPH BY PHILIP SEYMOUR

When I run into an old friend nowadays, the conversation often goes like this:

"Hey Tug, how ya been?"

"Fine, thank you."

"Whaddya doin' these days?"

"We'll talk about it over lunch."

"Do you miss it?"

"You bet I do! A lot!"

I hear those three questions all the time since I retired from Major League baseball. The last one is probably the most common. I mean even people I don't know are curious to find out if a guy can walk away from the incredible excitement of the arena and not miss it.

I was lucky enough to play pro baseball for over 20 years, 19 in the majors. If you don't already know it, I would like to say, "It's a great way to make a living." It's just a shame that athletes are only human and can't play forever. Since so many people are curious, and it is necessary to answer their inquiries so often, I had to kind of, in my own mind, break it down and figure out what parts of my old job I miss the most.

WHAT I DON'T MISS ABOUT BASEBALL

It's a process of elimination. It turns out that I simply miss the things you can't find in other fields outside the ballyard.

I don't miss the travel at all. I hated to pack. I was always forgetting something. Many times I would wake up in my hotel room wondering where I was. I used to leave on the bathroom light with the door open a crack, letting a little

light into the room. That would help me remember.

I think I saw enough of the National League cities, and I can always return for a visit if I want. So I don't miss them. As far as the clubhouse camaraderie, the teamwork, and joking around with the guys, there's still a lot of that in my new job as a feature reporter for WPVI-TV's Action News in Philadelphia. Actually, my new job could be even more interesting in that regard, because now I work with some terrific women as well. And they can joke around and add a whole new dimension of humor that didn't exist in the clubhouse. I don't really miss the teamwork either. Turns out that's part of any job where you're working with other people.

Don't really miss the fans either. I find that as I go about my daily routine, enough people say hello and like to share a special memory.

MY LIFE ON THE MOUND

So, what do I miss about my old job as a short reliever in the great National League?

It's the pump! I mean that natural high you get when the game is on the line, men in scoring position, bottom of the ninth, your team hanging on by a skimpy run. The other team is on a roll. The phone rings in the bullpen, and the coach says, "Tugger, get ready! Hurry up!"

Wow! Right away your stomach feels like you've got in it every species of butterfly ever known. Your legs feel weak like you've suddenly been stricken with a crippling disease. You

TUG MCGRAW starred as a southpaw relief pitcher for two World Series winners—the 1969 New York Mets and the 1980 Philadelphia Phillies.

start getting your arm and body loose, which is like trying to bend a two-by-four. You glance out on the field. Your eye catches a uniform walking from the dugout to the mound. You hurry to get in a few more warm-up throws. You glance out again, and here comes the man in blue with his left arm raised, waving for you to join the fun. You quickly sneak in a couple of last tosses, testing the ump's patience, and begin the long walk to the center of the diamond and the focus of everyone's attention.

Your heart is about to leave your body. It's pounding "big time." You look up into the stands while kicking the dirt around the mound. You're here. It seems like such a long walk, yet you're here already. Can't seem to breathe right. Take your eight allotted adjustment pitches, during which you notice a glowing stare from the next hitter.

You begin now to settle in and feel ready. Deep breaths. The adrenaline pumps throughout your body. You now feel strong, confident, and ready. The hitter steps into the box, and the crowd is on its feet going wild. You decide on a pitch, get the right sign from the catcher, one more deep breath, start your motion. . . .

MEMORIES ARE MADE OF THIS AND THAT

Yes, that's what I miss. Whew, I get excited just thinking about it. It's tough to find anything like it outside the arena.

But since we're only human, we try. One thing I'll always have to enjoy and share are the memories. Having been lucky enough to play in four World Series, winning two, with lots of exciting games in between, I've definitely got tons of memories of great teams, fantastic games, and terrific players. Playing for the New York Mets for nine years and being there when

we won our first World Series (1969) was enough fun and excitement for any player to have in a lifetime.

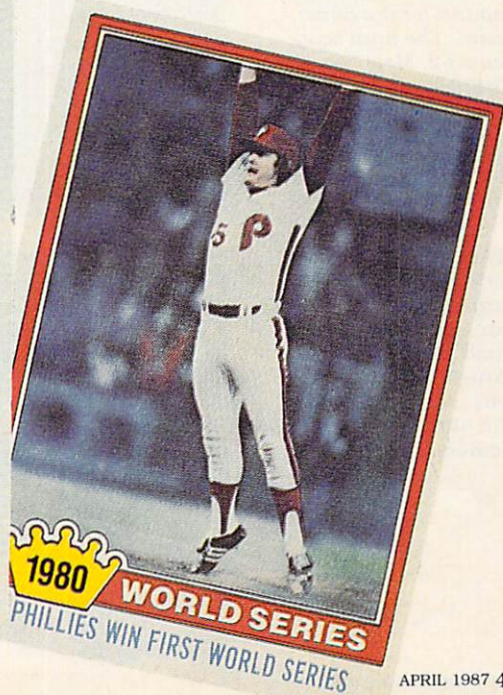
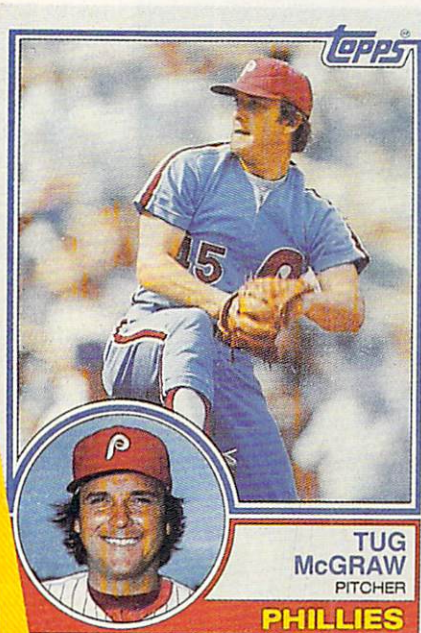
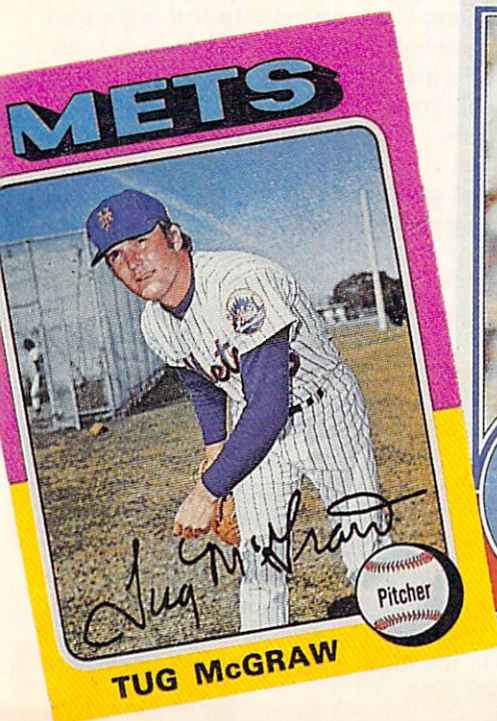
But I was really lucky; I had a second career. The Mets traded me to Philadelphia, where I squeezed in another 10 years and was with them in 1980 when we won the Phillies' first World Championship in the history of the city of brotherly love. Second wow!

In looking back, I often wondered what it would have been like to have the '69 Mets play against the '80 Phillies. People are always asking me which team I thought was best. It's an intriguing question. It really would be fun to experience these two great teams facing off against each other. Ah, why bother with such hypothetical thoughts? It could never happen any more than we could bring back Babe Ruth's 1927 Yankees or the 1965 Dodgers with Sandy Koufax. Those days are gone. Only good for trivia questions, right?

Well not anymore. There are so many computer games on the market today, with such a variety of approaches to playing high-tech baseball, that you can relive and practically watch in living color any contest you want to play. Computer baseball games give people of any age or degree of interest in the game the opportunity to go as far as a memory, thought, or imaginative fantasy can take them.

You can make lineups of your choice, picking Hall of Famers, great teams of the past, or your own personal favorite, all-star lineups. With some games, you can pick your own neighborhood buddies and make up teams. Then, with many of the games, you can even draft players, start leagues, and all that stuff. If you're not too bright, you become eligible to manage. Computer baseball games definitely take our love of the game much further than I

Just as computer baseball games help bring back memories, so do baseball cards. From left to right: Here's our author as a young Met, as an older Phillie, and as a winning pitcher in the 1980 World Series.



**YOU DECIDE ON A
PITCH, GET THE
RIGHT SIGN
FROM THE
CATCHER, ONE
MORE DEEP
BREATH, START
YOUR MOTION...**

ever imagined possible.

I sampled several different packages, pitting against each other where possible my favorite two teams: the 1969 World Champion New York Mets and the 1980 World Champion Philadelphia Phillies. I couldn't wait to see what might happen if the promising young lefty in the Mets bullpen would have to go head-to-head with the older, wiser, and more experienced lefty in the Phillies bullpen.

While I was playing these games and waiting for the ultimate situation (pitching against myself) to develop, I couldn't believe how these two teams—with the computer keyboard and screen as the vehicle—took me on a glorious trip down memory lane. Remembering and actually reliving in my mind some of the great players and their unbelievable talents. Center fielder Tommie Agee's great catches in the World Series. Ron Swoboda's diving stab for a Brooks Robinson looping liner to right. Bud Harrelson's super defense at short, and catcher Jerry Grote's strong arm. Tom Seaver, Jerry Koosman, and Nolan Ryan blowing people away as they head for the Hall of Fame.

Then my Phillie days. Greg Luzinski and Mike Schmidt launching missiles into the upper decks, and Larry Bowa's unpolished but nearly perfect performances at shortstop. Manny Trillo's smooth, smiling style with that underarm snap throw to first, always just in the nick of time. Steve Carlton's slider snapping below swinging Louisville Sluggers, send-

ing the greatest hitters of our time back to the dugout shaking their heads.

MAKING BASEBALL COME ALIVE

I was invited up to FAMILY COMPUTING to offer my practiced opinion of baseball programs. These computer games can make baseball come alive any time you're in the mood. You can enjoy them by yourself or play with friends. Just turn them on, slip in the disk, and away you go!

I played three types of games. The first type, such as *APBA Baseball* or *Radio Baseball*, uses real players and their stats from historical teams to determine the outcome of any game. You're the manager in these strategy games that offer words only, no graphics. The second type combines historical teams with graphics and fewer words than the first type. Two examples for budding managers are *Micro League Baseball* and *Pure-Stat Baseball*. The third type makes you the player, not the manager, but the players are made up, not ones from history. *Hardball* is a good example from this group.

When I visited the FAMILY COMPUTING offices, we began with *APBA Major League Players Baseball*. It was really neat. As a manager would do, my editor picked his lineup from the 1969 Mets roster the disk provided (for some reason, my buddy, the starting third baseman, Ed "The Glider" Charles, was not listed). I did the same from the 1980 Phillies roster, and we proceeded to play ball.

The game gave fairly accurate player ratings and interesting, sometimes suspenseful descriptions of the play action. There were no little computerized figures running around on the screen. Instead, the play action was clearly described and simulated many visual flashbacks in my mind. I liked playing. The system provided ample opportunity to test my knowledge of baseball strategy by using such situations as bunts, steals, hit-and-run plays, and lineup flip-flops with pitchers and pinch hitters. I was even able to act as a third-base coach and was confronted with the dreaded decision of whether to hold a runner up or give him the green light for home. No one should be put in that position. Not even on a computer.

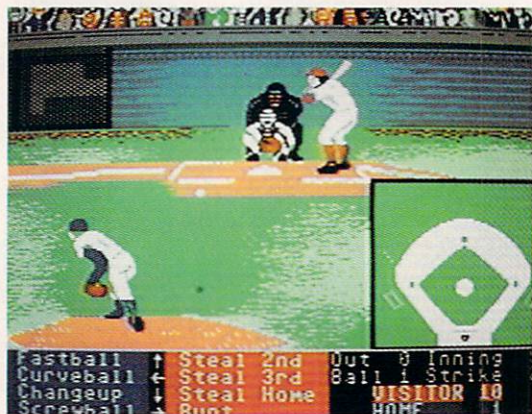
When I was an active player, on occasion I found myself disagreeing with the umpires. Well, I must admit that in several instances I was caught hollering unfriendly overtures at the machine. At least you can say what you want to a computer and not get thrown out of the game.

The game went well. Both teams played good baseball. The starting pitchers (Seaver vs. Carlton) dominated, and hits were scattered. One situation surprised me. With the Mets batting and a fly ball to center, the computer let Garry Maddox drop a ball. Error! I couldn't believe it. Maddox, a multiple Gold Glove win-

Opening screen—top of the first—for the APBA Major League Players Baseball game between Tug McGraw's two World-Series-winning teams: the 1969 Mets and the 1980 Phillies. Bake McBride is at bat; Tom Seaver is on the mound for the home team. The final score was 3-2, Mets over the Phillies in 19 innings.



When playing baseball with *Hardball*, the graphics are sharp, and you get to choose how each pitch will be thrown (see bottom left). You also control the hitter, runners, and fielders.



THE LINEUP OF COMPUTER BASEBALL GAMES

When shopping, you'll find two basic styles of computer baseball programs. With most, you're the manager; in others, you're the players; and a few combine the two styles. In manager-style games, you make the strategic decisions, and the computer determines the outcome based on each ballplayer's statistics. These games use real baseball players from historical teams. In player-style games, you control the batter, pitcher, runners, and fielders with a mouse, the keyboard, or a joystick. Most ballplayers here are fictional, with names like Buck Butkowski.

APBA Major League Players Baseball. Random House Software, (800) 638-6460. 128K Apple, IBM PC/PCjr. \$60.

Based on the classic board game, this text-only game (arranged like a baseball diamond) gives vivid verbal accounts of each play. Make decisions as you play, such as whether to advance the runner from first to third on a single. Contains 26 team rosters

from the 1986 season, with additional team disks—including an Old-Timers disk—available separately (\$20 each).

Baseball Fanatic. Performing Arts Software, (317) 897-3591. 128K Apple IIe/IIc, 256K IBM PC. \$40 (\$50, not copy-protected).

A manager-style game with limited graphics, but excellent strategic decisions. Contains over 30 historical teams, and lets you add up to 10 more.

Championship Baseball. Gamemstar, a division of Activision, (415) 960-0410. Apple, C 64/128, IBM PC. \$35-\$40.

An arcade-style game where you control the ball players. Begin with batting practice, then play games. Uses fictional, not historical players.

Computer Baseball. Strategic Simulations Inc., (415) 964-1200. Amiga, Apple, Atari, C 64/128, IBM PC/PCjr, 512K Macintosh. BASIC required for Amiga, Macintosh. \$15-\$40.

A manager-style game with some graphics. One of the first, and somewhat outdated. Contains 20 historical teams,

or you can input stats for your own players, real or imagined.

Earl Weaver Baseball. Electronic Arts, (415) 571-7171. 512K Amiga. \$50.

Choose to be either the manager, the players, or both in this newest of games. Strategy designed by Earl Weaver, long-time manager of the Baltimore Orioles. Contains eight historical teams and many details—such as "spring training" practice—that make for riveting play.

Hardball. Accolade, (408) 446-5757. Apple, Atari, Atari ST, C 64/128, IBM PC, Macintosh. \$30-\$45.

Joystick control makes this player-style game a quick play. You get to manage the fictional players, too.

Micro League Baseball. Micro League Sports Association, (302) 368-9990. Apple, Atari, Atari ST, C 64/128, IBM PC/PCjr. \$40-\$50.

Combines text and graphics in a manager-style game. One of the more popular baseball programs around. Package includes 25 historical rosters,

and various team disks are available at extra cost.

Pure-Stat Baseball. SubLogic, (217) 359-8482. Apple, C 64/128. \$50.

You're the manager in this graphics-based program. An optional disk (\$20) lets you set your games in a gaggle of different stadiums (all 26 current arenas). Contains every team from the 1985 season, plus eight teams from the more distant past.

Radio Baseball. Electronic Arts, (415) 571-7171. 256K IBM PC. \$40.

A text-only game that's similar to the APBA program, but its game descriptions are a bit corny in contrast. You choose to manage from 12 historical teams, with a separate team disk available.

The World's Greatest Baseball Game. Epyx, (415) 366-0606. Apple, C 64/128, IBM PC/PCjr. \$30.

Either manage your players, or be both manager and player at the same time. Uses graphics. Contains over 75 historical teams. —D.H.

ner, was one of the best ever. It really caught me off guard. But on a rare occasion when the "Secretary of Defense" would boot one in a real game, that blew me away, too. So the computerized version definitely makes it interesting.

The game was nothing-nothing until the top of the 14th, when the Phillies scored two runs. The Mets came back in the bottom of the inning with two more, which kept the game going until the bottom of the 19th inning. Whew! That's when Ken Boswell scored from second on a single, something he would never have done in the real arena. I yelled and screamed, but it didn't help.

All in all, the APBA computer game portrayed most of the players as I remembered them, and I even enjoyed managing the team. I especially liked it when my relief pitcher, Tug McGraw, got to bat against the Met pitcher, another fella named McGraw. While he didn't get a hit, he did put good wood on the ball. Reminded me of the time in old Jarry Park in Montreal when I hit my only home run off Carl Morton.

LET'S PLAY TWO (MORE)

During the rest of my day at FAMILY COMPUTING, and after I got home, I tried two more computer baseball games, *Hardball* and *Micro League Baseball*. I felt at home playing *Hardball*, since I got to pitch and bat instead of just manage. It reminded me of video games I've played in the arcade with my kids. It's a lot more exciting playing these games with a

friend than by yourself against the computer. I enjoy competing with other people; that way you can have fun and joke around. Playing against the computer is like batting practice with Iron Mike (a pitching machine): You can hone your skills, but it's not as much fun as the real thing.

Micro League Baseball was similar to the APBA game. Both give you real players from teams of the past, and you're the manager. *Micro League* adds pictures of little ballplayers running around but has shorter descriptions of each play. I found that the graphics didn't stimulate my memory as much as the verbal descriptions. The more words, the better, since they helped draw pictures in my mind. In either game, as you play over time, the same phrases pop up again and again. That could get boring, but just as with real baseball announcers, the same words in different situations brew up fresh memories.

I found all the computer baseball games fascinating because, as an extension of baseball, they can reach out to people. With the computer as time machine, you can get an emotional gift from players of the past. As someone once told me, you can only remember the past; you can't relive it. Yet this high-tech method actually helped me recreate the past, bringing back many of the same sensations I had while playing the game—the emotions, the energy, the competitive spirit, if not the dirt and the sweat—but I didn't wake up in the morning with a sore elbow. ☐

COMPUTER BASEBALL GAMES GIVE PEOPLE THE OPPORTUNITY TO GO AS FAR AS A MEMORY, THOUGHT, OR IMAGINATIVE FANTASY CAN TAKE THEM.



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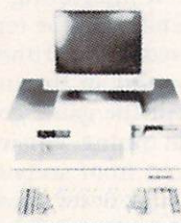
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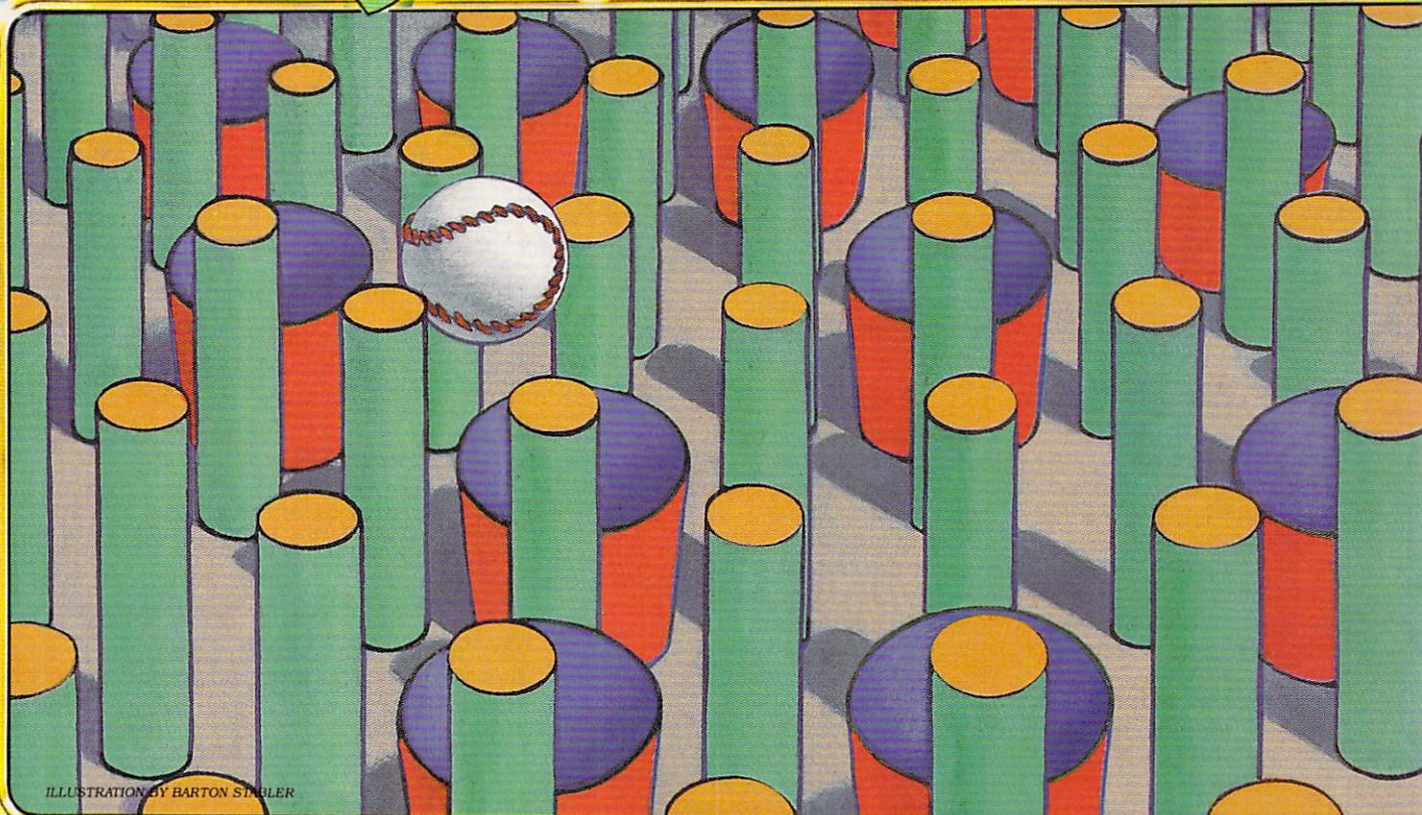


ILLUSTRATION BY BARTON STABLER

A P R I L

FUN AND GAMES PROGRAM

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A *Drop in the Bucket* may not sound like much, but it can add up to a lot if you're lucky.

SPORTS MANAGEMENT PROGRAM

Page 54

Find out if your team is batting a thousand or pitching a fit with *Baseball Stats*.

MORE PROGRAMS IN PERSONAL FINANCE

Page 14

Our short *Annuities* program can help figure your future.

PROGRAMMING P.S.

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Corrections to previous months' programs.

TIPS TO THE TYPIST

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How to type in FAMILY COMPUTING's programs, and what to do if a program doesn't work.

ILLUSTRATION BY JAMES CHERRY III

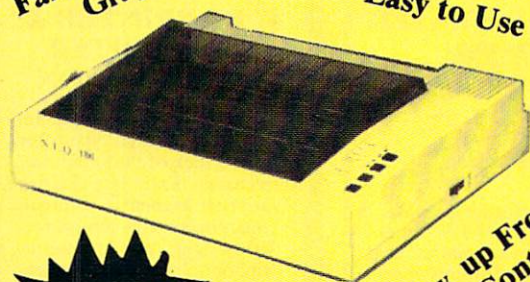
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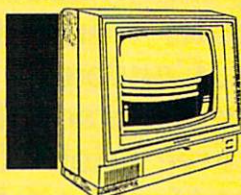
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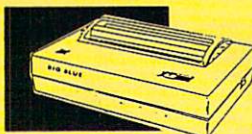


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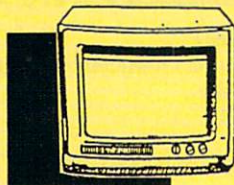
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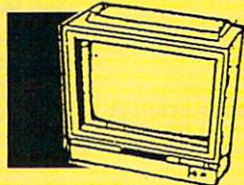


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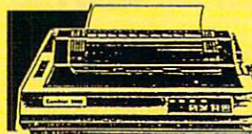


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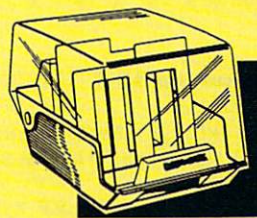


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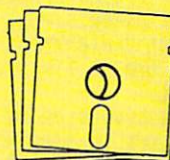


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FUN AND GAMES PROGRAM

```

190 FOR X=375 TO 464:POKE X+SM,PEEK(X+SM-120):NEXT X
200 POSITION 5,0
210 PRINT "High Score: ";HS,"Score: 0 ";
220 SC=0
230 POKE 764,255:CO=INT(RND(0)*30)+5:RO=1:FL=1
240 POKE SM+RO*40+CO,84
250 IF PEEK(764)=33 THEN 320
260 POKE SM+RO*40+CO,0
299 REM --DUMMY CALCULATION USED FOR SHORT DELAY--
300 IF CO=0 OR CO=39 THEN FL=FL:SOUND 0,10,12,15:DUM=
FL*1:SOUND 0,0,0,0
310 CO=CO+FL:GOTO 240
320 HR=RO:HC=CO
330 POKE SM+RO*40+CO,84
340 FOR DE=1 TO 10:NEXT DE
350 POKE SM+RO*40+CO,0
360 RO=RO+1:IF RO=20 THEN 420
370 PEG=PEEK(SM+RO*40+CO):IF NOT PEG THEN 320
380 FOR X=15 TO 0 STEP -3:SOUND 0,10,12,X:NEXT X
390 I=INT(RND(0)*2)*2-1
400 CO=CO+I:IF CO<0 OR CO>39 THEN CO=HC:GOTO 390
410 GOTO 320
420 FOR X=1 TO 13
430 IF CO>=CH(X,1) AND CO<=CH(X,2) THEN T=CH(X,3):POKE
712,ASC(BC$(CO)):X=13
440 NEXT X:IF T=50 THEN T=T+RND(0)*50
450 IF T=0 THEN 510
460 FOR X=0 TO T-1:SOUND 1,255-X,10,14
470 IF X>50 THEN POKE 712,PEEK(20)
480 SC=SC+1:IF SC>HS THEN HS=SC
490 POSITION 5,0:PRINT "High Score: ";HS,"Score: ";SC;
500 NEXT X:SOUND 1,0,0,0:GOTO 230
510 POKE 712,64:FOR X=100 TO 200:SOUND 0,X,10,14
520 SOUND 1,X+1,10,14:NEXT X:SOUND 1,0,0,0
530 FOR X=15 TO 0 STEP -0.2:SOUND 0,100,8,X:NEXT X
540 POSITION 15,9:PRINT "GAME OVER"
550 POKE 764,255:GOTO 140
560 POSITION 5,0:PRINT "High Score: ";HS,"Score: ";SC;:N
EXT X
1000 DATA 224,1,147,5,224,1,163,5,224,4,134,3,191,2
1010 DATA 135,3,224,4,163,5,224,1,147,5,224,1
1020 DATA 0,0,0,1,5,5,6,6,0,7,11,10,12,15,0
1030 DATA 16,18,25,19,20,50,21,23,25,24,27,0
1040 DATA 28,32,10,33,33,0,34,38,5,39,39,0
1050 DATA X 5 X 10 X 25 ?? 25 X 10 X 5

```

Commodore 64 & 128 (C 64 mode)/Drop in the Bucket

```

10 DIM CH(13,4):DN=51164:HS=0:OV=51163:S=54272:SB=1024
20 BS="":BK$=CHR$(144):BL$=CHR$(31):MS=BL$+CHR$(113):S
P$=CHR$(32)
30 FOR X=S TO S+23:POKE X,0:NEXT X
40 POKE S+5,17:POKE S+6,66:POKE S+24,15
50 D$=SP$+SP$+" "
60 FOR X=49700 TO 49710:READ ML:POKE X,ML:NEXT X
70 FOR X=1 TO 13:FOR Y=1 TO 4:READ CH(X,Y):NEXT Y,X
80 FOR X=1 TO 13:READ KO,N
90 FOR Y=1 TO N:BS=BS+CHR$(KO)+SP$
100 NEXT Y,X:BS=CHR$(18)+BS:PRINT BL$:CHR$(147);
110 POKE 53280,5:POKE 53281,15
120 PRINT TAB(8);"-- A DROP IN THE BUCKET --"
130 FOR X=0 TO 719 STEP 3:POKE 55376+X,0:POKE 1104+X,4
6:NEXT X
140 POKE 214,20:PRINT
150 FOR X=1 TO 3:PRINT BS;:NEXT X
160 READ TX$:PRINT CHR$(146):BL$:TX$;
170 POKE SB+999,24
180 POKE DN,11:POKE OV,6:SYS 49700
190 PRINT "PRESS <SPACE BAR> TO BEGIN OR"
200 PRINT TAB(15);"<Q> TO QUIT";
210 GET K$:IF K$="Q" THEN PRINT CHR$(147):END
220 IF K$<>SP$ THEN 210
230 FOR X=0 TO 91:POKE X+1439,PEEK(X+1319):POKE 55711+

```

```

X,0:NEXT X:POKE 198,0
240 SC=0:POKE 53280,5:PRINT CHR$(19);TAB(19):FOR X=1 T
O 7:PRINT SP$;:NEXT X
250 PRINT CHR$(19);BL$:TAB(6);"HIGH SCORE: ";HS:TAB(26)
;"SCORE: 0 "
260 CO=INT(RND(1)*30)+5:RO=1:FL=1
270 POKE DN,RO:POKE OV,CO:SYS 49700:PRINT MS;
280 GET K$:IF K$=SP$ THEN 320
290 POKE DN,RO:POKE OV,CO:SYS 49700:PRINT SP$;
300 IF CO=0 OR CO=39 THEN FL=FL:POKE S+4,33:POKE S,10
4:POKE S+1,9:POKE S+4,32
310 CO=CO+FL:GOTO 270
320 POKE DN,RO:POKE OV,CO:SYS 49700:PRINT MS;
330 FOR DE=1 TO 20:NEXT DE
340 HR=RO:HC=CO
350 POKE DN,HR:POKE OV,HC:SYS 49700:PRINT SP$;
360 RO=RO+1:IF RO=21 THEN 420
370 P=PEEK(SB+CO+40*RO):IF P<>46 THEN 320
380 POKE S+4,129:POKE S,24:POKE S+1,14:POKE S+4,128
390 I=INT(RND(1)*2)*2-1
400 CO=CO+I:IF CO<0 OR CO>39 THEN CO=HC:GOTO 390
410 GOTO 320
420 FOR X=1 TO 13
430 IF CO>=CH(X,1) AND CO<=CH(X,2) THEN POKE 53280,CH
(X,3):T=CH(X,4):X=13
440 NEXT X:IF T=50 THEN T=T+RND(1)*50
450 IF T=0 THEN 520
460 POKE S+4,33:FOR X=0 TO T-1:POKE S,48:POKE S+1,X
470 IF X>50 THEN POKE 53280,RND(1)*15
480 SC=SC+1:IF SC>HS THEN HS=SC
490 PRINT CHR$(19);BL$:TAB(6);"HIGH SCORE: ";HS:TAB(26)
;"SCORE: ";SC;
500 NEXT X:POKE S+4,32
510 POKE 198,0:GOTO 260
520 POKE S+4,33:FOR X=70 TO 20 STEP -1
530 POKE S,48:POKE S+1,X:NEXT X:POKE S+4,32
540 POKE DN,10:POKE OV,15:SYS 49700
550 PRINT "GAME OVER"
560 PRINT TAB(3);"PRESS <SPACE BAR> TO PLAY AGAIN"
570 PRINT TAB(13);"OR <Q> TO QUIT"
580 GET K$:IF K$="Q" THEN PRINT CHR$(147):END
590 IF K$<>SP$ THEN 580
600 POKE 198,0:GOTO 230
1000 DATA 174,220,199,172,219,199,24,32,240,255,96
2000 DATA 0,0,2,0,1,5,13,5,6,6,2,0,7,11,14,10,12,15,2
2010 DATA 0,16,18,7,25,19,20,10,50,21,23,7,25,24,27,2
2020 DATA 0,28,32,14,10,33,33,2,0,34,38,13,5,39,39,2,0
2030 DATA 28,1,153,5,28,1,154,5,28,4,158,3,150,2,158,3
2040 DATA 28,4,154,5,28,1,153,5,28,1
2050 DATA "X 5 X 10 X 25 ?? 25 X 10 X 5"

```

IBM PC & compatibles/Drop in the Bucket

This program has been tested and found to work on the following computers and hardware configurations using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```

10 KEY OFF:WIDTH 40
20 DIM BS(13,2),CH(13,4):HS=0:SC=0
30 BS="":MS="":SP$=CHR$(32):DS$=SP$+SP$+" "
40 FOR X=1 TO 14:DT$=DT$+DS$:NEXT X:DT$=" "+DT$
50 FOR X=1 TO 13:FOR Y=1 TO 4:READ CH(X,Y):NEXT Y,X
60 FOR X=1 TO 13:READ KO,N:BS(X,1)=KO:BS(X,2)=N
70 NEXT X:COLOR 1,7,2:CLS
80 PRINT TAB(9);"-- A Drop in the Bucket --":COLOR 0
90 LOCATE 3,1,0:FOR X=1 TO 6:PRINT SP$;MID$(DT$,2,38)
100 PRINT SP$;MID$(DT$,3,38):PRINT SP$;MID$(DT$,4,38)
110 NEXT X:PRINT:FOR L=1 TO 3:PRINT SP$;
120 FOR X=1 TO 13:COLOR BS(X,1)
130 FOR Y=1 TO BS(X,2):PRINT CHR$(219);:NEXT Y,X
140 IF L<3 THEN PRINT
150 NEXT L:READ TX$:COLOR 1:LOCATE 25,1:PRINT TX$;
160 LOCATE 12,6:PRINT "Press <SPACE BAR> to begin or"
170 LOCATE 13,16:PRINT "<Q> to quit";

```



```

180 K$=INKEY$:IF K$="Q" OR K$="q" THEN CLS:END
190 IF K$<>SP$ THEN 180
200 LOCATE 12,6:COLOR 0
210 PRINT SP$;LEFT$(DT$,30):PRINT SP$;MID$(DT$,3,34)
220 SC=0:COLOR 2:LOCATE 1,19:PRINT SP$;SP$;
230 LOCATE 1,6:COLOR 1
240 PRINT "High score: ";HS;" Score: 0 "
250 CO=INT(RND*30)+5:RO=2:FL=1
260 LOCATE RO,CO:PRINT M$;
270 FOR DE=1 TO 10:NEXT DE
280 K$=INKEY$:IF K$=SP$ THEN 370
290 LOCATE RO,CO:PRINT M$;
300 IF CO=2 OR CO=39 THEN FL=-FL:SOUND 3300,1
310 CO=CO+FL:GOTO 260
320 RO=RO+1:IF RO=22 THEN 400
330 P=SCREEN(RO,CO):IF P<>46 THEN 370
340 SOUND 1000,1
350 I=INT(RND*3)-1:IF I=0 THEN 350
360 CO=CO+I:IF CO<2 OR CO>39 THEN CO=HC:GOTO 350
370 HR=RO:HC=CO:LOCATE RO,CO:PRINT M$;
380 FOR DE=1 TO 50:NEXT DE
390 LOCATE HR,HC:PRINT SP$;:GOTO 320
400 FOR X=1 TO 13
410 IF CO>=CH(X,1) AND CO<=CH(X,2) THEN COLOR ,CH(X,3)
420 NEXT X:IF T=50 THEN T=T+RND*50
430 IF T=0 THEN 500
440 FOR X=0 TO T-1:SOUND 500+T*5,1
450 IF X>50 THEN COLOR ,RND*15
460 SC=SC+1:IF SC>HS THEN HS=SC
470 LOCATE 1,6:COLOR 1
480 PRINT "High score: ";HS;" Score: ";SC;" ";
490 NEXT X:GOTO 250
500 FOR X=70 TO 20 STEP -1:SOUND X*5,1:NEXT X
510 LOCATE 11,16:PRINT "Game Over"
520 LOCATE 12,6:PRINT "Press <SPACE> to play again"
530 LOCATE 13,13:PRINT "or <Q> to quit."
540 K$=INKEY$:IF K$="Q" OR K$="q" THEN CLS:END
550 IF K$<>SP$ THEN 540
560 LOCATE 11,8:COLOR 0
570 PRINT MID$(DT$,4,18):PRINT SP$;MID$(DT$,2,33)
580 PRINT SP$;MID$(DT$,3,34):GOTO 220
1000 DATA 2,2,4,0,3,7,2,5,8,8,4,0,9,12,1,10,13,16,4,0
1010 DATA 17,19,6,25,20,21,3,50,22,24,6,25,25,28,4,0
1020 DATA 29,32,1,10,33,33,4,0,34,38,2,5,39,39,4,0,4,1
1030 DATA 2,5,4,1,1,4,4,4,6,3,3,2,6,3,4,4,1,4,4,1,2,5
1040 DATA 4,1
1050 DATA " X 5 X 10 X 25 ?? 25 X 10 X 5 X "

```

Tandy Color Computer/Drop in the Bucket

```

10 SB=1024:HS=0:SL=1472:DIM CH(13,4):SP$=CHR$(32)
20 CLS
30 FOR X=1089 TO 1439 STEP 3
40 POKE X,110:NEXT X
50 FOR X=1 TO 13:READ NU,KO:FOR Y=SL TO SL+NU
60 SL=SL+1:POKE Y,KO:NEXT Y,X
70 FOR X=1 TO 13:FOR Y=1 TO 3:READ CH(X,Y):NEXT Y,X
80 READ LI$:PRINT@480,LI$;:POKE 1535,88
90 PRINT@4,"- A DROP IN THE BUCKET -";
100 PRINT@195,"PRESS <SPACE BAR> TO BEGIN"
110 PRINT@233,"OR <Q> TO QUIT";
120 K$=INKEY$:IF K$="Q" THEN CLS:END
130 IF K$<>SP$ THEN 120
140 FOR X=1187 TO 1270:POKE X,PEEK(X-96):NEXT X
150 SC=0:PRINT@3,"HIGH SCORE: ";HS;" SCORE: ";SC;" ";
160 CO=RND(22)+5:RO=1:FL=1
170 POKE SB+32*RO+CO,106
180 K$=INKEY$:IF K$=SP$ THEN 220
190 POKE SB+32*RO+CO,143
200 IF CO=0 OR CO=31 THEN FL=-FL:SOUND 1,1
210 CO=CO+FL:GOTO 170
220 HR=RO:HC=CO

```

```

230 POKE SB+RO*32+CO,106
240 FOR DE=1 TO 25:NEXT DE
250 POKE SB+RO*32+CO,143
260 RO=RO+1:IF RO=14 THEN 320
270 P=PEEK(SB+CO+32*RO):IF P<>110 THEN 220
280 SOUND 250,1
290 I=INT(RND(0)*2)*2-1
300 CO=CO+I:IF CO<0 OR CO>31 THEN CO=HC:GOTO 290
310 GOTO 220
320 FOR X=1 TO 13
330 IF CO>=CH(X,1) AND CO<=CH(X,2) THEN T=CH(X,3)
340 NEXT X:IF T=50 THEN T=T+RND(50)
350 IF T=0 THEN 410
360 FOR X=0 TO T-1:SOUND T,1
370 IF X>50 THEN SOUND T,1
380 SC=SC+1:IF SC>HS THEN HS=SC
390 PRINT@3,"HIGH SCORE: ";HS;" SCORE: ";SC;" ";
400 NEXT X:GOTO 160
410 FOR X=70 TO 20 STEP -2
420 SOUND X,1:NEXT X
430 PRINT@171,"GAME OVER";
440 PRINT@192,"PRESS <SPACE BAR> TO PLAY AGAIN";
450 PRINT@233,"OR <Q> TO QUIT";
460 K$=INKEY$:IF K$="Q" THEN CLS:END
470 IF K$<>SP$ THEN 460
480 GOTO 140
1000 DATA 0,191,2,223,0,191,3,175
1010 DATA 2,191,2,159,1,255
1020 DATA 2,159,2,191,3,175,0,191,2,223,0,191
1030 DATA 0,0,0,1,3,5,4,4,0,5,8,10
1040 DATA 9,11,0,12,14,25,15,16,50
1050 DATA 17,19,25,20,22,0,23,26,10
1060 DATA 27,27,0,28,30,5,31,31,0
1070 DATA X 5 X 10 X 25 ?? 25 X 10 X 5

```

VIC-20/Drop in the Bucket

```

10 DIM CH(13,4):HS=0:SB=256*PEEK(648)
20 CB=37888+256*(PEEK(648) AND 2):CS=36879
30 V=36878:S=36876
40 SP$=CHR$(32):LS=SP$:FOR X=2 TO 22:LS=LS+SP$:NEXT X
50 BS=CHR$(18):BK$=CHR$(144):BL$=CHR$(31)
60 FOR X=1 TO 13:FOR Y=1 TO 4:READ CH(X,Y):NEXT Y,X
70 FOR X=1 TO 13:READ KO,N
80 FOR Y=1 TO N:BS=BS+CHR$(KO)+SP$
90 NEXT Y,X:POKE CS,29
100 PRINT CHR$(147);SP$;BL$;"A DROP IN THE BUCKET";
110 FOR X=44 TO 418 STEP 3
120 POKE SB+X,46:POKE CB+X,0:NEXT X
130 READ LI$:POKE 214,20:PRINT
140 PRINT BS;BL$;CHR$(146);LI$;
150 POKE SB+505,24:POKE CB+505,6
160 POKE 214,9:PRINT:PRINT " PRESS <SPACE BAR> TO"
170 PRINT SP$;"PLAY OR <Q> TO QUIT. ";
180 GET K$:IF K$="Q" THEN PRINT CHR$(147):END
190 IF K$<>SP$ THEN 180
200 FOR X=0 TO 65:POKE SB+198+X,PEEK(SB+132+X)
210 POKE CB+198+X,0:NEXT X:POKE 198,0
220 POKE SB+8,32:POKE SB+9,32
230 PRINT CHR$(19):SP$;BL$;"HIGH: ";HS;
240 PRINT TAB(11);"SCORE: 0 "
250 CO=INT(RND(1)*16)+5:RO=1:FL=1
260 POKE SB+22*RO+CO,81:POKE CB+22*RO+CO,6
270 GET K$:IF K$=SP$ THEN 310
280 POKE SB+22*RO+CO,32
290 IF CO=0 OR CO=21 THEN FL=-FL:POKE S,128:POKE V,15:
POKE S,0
300 CO=CO+FL:GOTO 260
310 POKE SB+22*RO+CO,81:POKE CB+22*RO+CO,6
320 FOR DE=1 TO 15:NEXT DE
330 HR=RO:HC=CO
340 POKE SB+22*RO+CO,32
350 RO=RO+1:IF RO=21 THEN 410
360 P=PEEK(SB+CO+RO*22):IF P<>46 THEN 310

```



```

370 POKE V,15:POKE S,232:FOR DE=1 TO 5:NEXT DE
380 POKE S,0:I=INT(RND(1)*2)*2-1
390 CO=CO+I:IF CO<0 OR CO>21 THEN CO=HC:GOTO 380
400 GOTO 310
410 FOR X=1 TO 13
420 IF CO<CH(X,1) OR CO>CH(X,2) THEN 440
430 POKE CS,PEEK(CS) AND 248 OR CH(X,3):T=CH(X,4):X=13
440 NEXT X:IF T=50 THEN T=T+RND(1)*50
450 IF T=0 THEN 530
460 POKE V,14:FOR X=128 TO 127+T:POKE S,X
470 IF X>178 THEN POKE CS,PEEK(CS) AND 248 OR RND(1)*7
480 SC=SC+1:IF SC>HS THEN HS=SC
490 PRINT CHR$(19);SP$;BL$;"HIGH:";HS;
500 PRINT TAB(11);"SCORE:";SC
510 NEXT X:POKE S,0
520 POKE 198,0:GOTO 250
530 POKE 214,8:PRINT:PRINT L$
540 POKE 214,8:PRINT:PRINT SPC(6);"GAME OVER";SPC(7);
550 POKE V,15:FOR X=255 TO 140 STEP -1
560 POKE S,X:NEXT X:POKE S,0
570 SC=0
580 PRINT "PRESS <SPACE BAR> TO ";
590 PRINT "REPLAY OR <Q> TO QUIT."
600 GET K$:IF K$="Q" THEN PRINT CHR$(147):END
610 IF K$<>SP$ THEN 600
620 GOTO 200
1000 DATA 0,0,2,0,1,2,5,5,3,3,2,0
1010 DATA 4,5,6,10,6,7,2,0,8,9,0,25
1020 DATA 10,11,7,5,0,12,13,0,25
1030 DATA 14,15,2,0,16,17,6,5
1040 DATA 18,18,2,0,19,20,5,5,21,21,2,0
1050 DATA 28,1,30,2,28,1,31,2,28,2,144,2,158
1060 DATA 2,144,2,28,2,31,2,28,1,30,2,28,1
1070 DATA "X 5X10X 25??25 X10X 5"

```

PROGRAMMING P.S.

Corrections to Previous Months' Programs

The Twelve Days of Christmas (December 1986, page 102)

TI-99/4A: This program requires that a 32K Memory Expansion Card be installed and will only run under TI Extended BASIC.

Computer Shake (January 1987, page 89)

Atari 400/800, 600/800XL, & 130XE: This program requires a minimum of 32K RAM.

Dots (February 1987, page 78)

Apple II series: Due to a printer's error, line 290 did not print clearly. The line should read as follows:

```
290 CX = CX+(K$ = "L")-(K$ = "J")
```

Roman Numeral Converter (March 1987, page 54)

Tandy Color Computer w/Extended BASIC: In order to get the Arabic equivalent of Roman numerals containing D, you must add an integer function to line 510. Here's how the revised line should read:

```
510 NEXT Y:NEXT X:RN=INT(RN)
```

STATS A HIT

USE THIS PROGRAM TO TRACK YOUR FAVORITE TEAM'S PERFORMANCE

BY PASQUALE "SLUGGER" CIRULLO

We all know the importance of statistics in baseball. Davey Johnson of the New York Mets computerized the statistics for his team and used them to lead his team to the World Championship in 1986.

Using *Baseball Statistics* to keep track of your team just might help you become a little more competitive. *Baseball Statistics* helps you keep a record of each player's performance for each game and for the entire season by calculating vital statistics, such as batting average and earned run average.

First, carefully type the program into your computer, SAVE it, proofread it carefully (see "Tips to the Typist" for help) and RUN it. Note that you cannot use the name SEASON when saving the program, or any other file on the same disk, or the program will not work.

Baseball Statistics uses the filename SEASON to store the team roster and season statistics. Therefore, if you want to keep statistics for more than one team (e.g., for an entire league), use a different disk for each team you are tracking.

USING BASEBALL STATISTICS

The first time you run the program, the computer will give you a message that it did not find the roster and season statistics. This is normal since you haven't yet told the computer who's on your team's roster. At this point, just type <1> and the computer will automatically let you input the names or find the disk with your team's roster and press <2>. (Do not use commas when giving the computer



the names of your teammates.) After typing the last name in the list, press RETURN or ENTER again. The computer will then list all the names and ask if they are correct. If they are not correct, you'll be able to reenter all the names from the beginning. If they are correct, the computer will proceed to the main menu.

Every time you run the program after this, the computer will load the roster automatically and then go directly to the main menu, which gives you the following seven choices:

1. ADD NAMES TO ROSTER

If you forget to add a player's name when you first set up the team, or if someone joins the team during the season, you can use this function to add his or her name to the roster. The other sections of the program will only let you enter stats for players listed on the roster. The

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roster has room for 30 people.

When the computer asks for the new players' names, type each one carefully, making sure not to use commas, and press RETURN or ENTER after each name. When you have no more names to add, press RETURN or ENTER again. The computer will list all the new names you entered and ask if they are correct. If any one is incorrect, you will have to enter them all again, so type carefully!

2. ENTER GAME STATS

This function records the performance of each player after a game. The computer will ask you for the Date of the Game, the Opponent, the Opponent's Score, and then Your Score. After you have given the computer this information, it will go through the roster, asking which members played. If you say a member did not play, the computer will go to the next member. If you say a member did play, the computer will ask you to enter that player's batting statistics. Be sure to tell the computer that the pitchers played even if they did not get to bat.

Once you've entered all the batting statistics, the computer will ask which of the players pitched. For those that did pitch, the computer will ask if the pitcher had a decision (enter "ND" for a No Decision, "W" for a Win, "L" for a Loss, or "SV" for a Save). It will also ask if the pitcher started the game, if he pitched a complete game, and what his or her other statistics were.

After entering the game statistics, display them on the screen or print them out (using menu choice 3) and check them for accuracy. If they are not correct, reenter all the stats for the game before continuing.

3. SHOW OR PRINT GAME STATS

This section will allow you to look at the statistics that you entered in the computer. The computer will first ask you if you want to see the stats on the screen or if you want a printout. If you want a printout, the computer will ask you to press <Y> when the printer is ready or any other key to return to the main menu. Make sure that there is paper in the printer and that the printer is turned on and on-line before you press <Y>. If you want to see the stats on the screen, the computer will stop when the screen is full to give you a chance to read them. When you want to continue to the next screen, just press any key.

4. ADD GAME TO SEASON STATS

Once you are sure the stats for the current game are correct, choose this section in order to incorporate them into the season statistics. Once a particular game has been added into the season totals, it cannot be taken out. This makes it very important that you check the game stats for accuracy before choosing this function.

5. PRINT SEASON STATS

This section will print the season statistics on the printer. (Season stats can't be displayed on the screen.) The computer will ask you to press <Y> when the printer is ready or any other key to return to the main menu. Check that there is paper in the printer and that the printer is turned on and on-line before pressing <Y>.

6. DISK ACCESS

This choice will present you with a second menu covering disk operations. It has four items for you to choose from: Catalog,

Load Game Stats, Save Game Stats, and Return to Main Menu.

- **CATALOG.** This will give you a list of all the games you've saved, plus any other files on the disk.

- **LOAD GAME STATS.** The computer will ask you for the name of the file (e.g., game) that you want to load, and then load that file into the computer's memory. You do not have to load the season stats (file name SEASON), since this is done automatically at the beginning of the program.

- **SAVE GAME STATS.** The computer will ask you for a file name, and then save the stats for the current game under that name. Make sure you never use the name SEASON for a game stats file since this name is reserved for the season stats.

• RETURN TO MAIN MENU.

This choice will return you to the main menu, where you can continue with other operations.

7. QUIT

When you finish the program and choose Quit, three things happen. First, the computer checks whether you SAVED the Game Stats that were entered. Second, it automatically SAVES the Season Stats file (using the name SEASON). Finally, the computer ENDS the program. Always exit the program using Quit, or the season stats will not be saved. (NOTE: Due to error-checking routines in the Apple and IBM PC versions of the program, typing errors will not produce a syntax error. Therefore, show extra caution when typing the program into the computer.)

Apple II series w/48K RAM, disk drive, printer, & DOS 3.3/Baseball Statistics

```
10 FL = 1:HOME;DS = CHR$(4)
20 DIM B(14),BMS(7),C(15),DMS(4),GP(30,6),GS(30,10)
30 DIM NI(30),PS(30,4),RGS(30),RSS(31),SP(30,15)
40 DIM SS(30,14),TBS(10),TPS(6)
50 PRINT TAB(7);"MAKE SURE CAPS LOCK IS ON"
60 FOR X = 1 TO 7:READ BMS(X):NEXT X
70 FOR X = 1 TO 4:READ DMS(X):NEXT X
80 FOR X = 1 TO 10:READ TBS(X):NEXT X
90 FOR X = 1 TO 6:READ TPS(X):NEXT X
100 FOR X = 1 TO 14:READ B(X):NEXT X
110 FOR X = 1 TO 15:READ C(X):NEXT X
120 SS = "":FOR X = 1 TO 40:SS = SS+"":NEXT X
130 POKE 216,0:ONERR GOTO 10000
140 PRINT DS;"OPEN SEASON":PRINT DS;"READ SEASON"
150 INPUT NP:FOR X = 1 TO NP:INPUT RSS(X)
160 FOR Y = 1 TO 14:INPUT SS(X,Y):NEXT Y
170 FOR Y = 1 TO 15:INPUT SP(X,Y):NEXT Y
180 NEXT X:PRINT DS;"CLOSE SEASON"
190 HOME:POKE 216,0:ONERR GOTO 12000
200 PRINT:PRINT SS:PRINT
210 PRINT TAB(10);"BASEBALL STATISTICS"
220 PRINT:FOR X = 1 TO 7:PRINT SPC(7);BMS(X)
230 NEXT X:PRINT:PRINT SS
240 PRINT:INPUT "SELECT: ";A
250 IF A < 1 OR A > 7 THEN 190
260 ON A GOTO 1000,2000,3000,4000,5000,270,9000
270 HOME:POKE 216,0:ONERR GOTO 11000
280 PRINT:PRINT SS:PRINT
290 PRINT TAB(15);"DISK ACCESS"
300 PRINT:FOR X = 1 TO 4:PRINT SPC(9);DMS(X)
310 NEXT X:PRINT:PRINT SS
320 PRINT:INPUT "SELECT: ";A
330 IF A < 1 OR A > 4 THEN 270
340 ON A GOTO 6000,7000,8000,190
999 REM -- ADD NAMES TO ROSTER --
```


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SPORTS MANAGEMENT PROGRAM

```

1000 HOME:PRINT "PRESS <RETURN> AFTER EACH NAME"
1010 PRINT "PRESS <RETURN> AFTER ENTERING"
1020 PRINT "THE FINAL NAME.":PRINT
1030 N = NP
1040 N = N+1:INPUT "NAME: ";RS$(N)
1050 IF RS$(N) = "" THEN 1090
1060 IF N <> 31 THEN 1040
1070 PRINT "YOU HAVE REACHED THE LIMIT."
1080 GOSUB 14000
1090 PRINT:FOR X = NP+1 TO N:PRINT RS$(X):NEXT X
1100 PRINT "IS IT CORRECT? ";
1110 GET Z$:IF Z$ <> "Y" AND Z$ <> "N" THEN 1110
1120 PRINT Z$
1130 IF Z$ = "Y" THEN NP = N-1:GOTO 190
1140 PRINT "REENTER ROSTER":GOTO 1030
1999 REM -- ENTER GAME STATS --
2000 IF FL = 1 THEN 2050
2010 PRINT "THE GAME STATISTICS WERE NOT SAVED."
2020 PRINT "TYPE <1> FOR ANOTHER CHANCE TO SAVE,"
2030 PRINT "OR TYPE <2> TO CONTINUE. "
2040 INPUT " ";Z:ON Z GOTO 270,2050:GOTO 2040
2050 HOME:IN = 0:FL = 0:INPUT "DATE: ";DT$
2060 INPUT "OPPONENT: ";OS
2070 INPUT "OPPONENT'S SCORE: ";OS
2080 INPUT "YOUR SCORE: ";YS
2090 P = 0:FOR X = 1 TO NP:PRINT "DID ";RS$(X);
2100 PRINT " PLAY? ";
2110 GET Z$:IF Z$ <> "Y" AND Z$ <> "N" THEN 2110
2120 PRINT Z$:IF Z$ = "N" THEN 2180
2130 HOME:PRINT "ENTER STATS FOR ";RS$(X);"."
2140 PRINT "LIMIT STATS TO THREE DIGITS"
2150 PRINT:P = P+1:RG$(P) = RS$(X):NI(P) = X
2160 FOR Y = 1 TO 10:PRINT TP$(Y);
2170 INPUT " ";GS(P,Y):NEXT Y:PRINT
2180 NEXT X:HOME
2190 FOR X = 1 TO P:PRINT "DID ";RG$(X);
2200 PRINT " PITCH? ";
2210 GET Z$:IF Z$ <> "Y" AND Z$ <> "N" THEN 2210
2220 PRINT Z$:PS(X,1) = Z$:IF PS(X,1) = "N" THEN 2310
2230 HOME:PRINT "ENTER PITCHER STATS FOR ";RG$(X);"."
2240 PRINT "WHAT WAS THE DECISION?"
2250 INPUT "ENTER ND, W, L, OR SV. ";PS(X,2)
2260 PRINT "DID THIS PITCHER START"
2270 INPUT "THE GAME? ";PS(X,3):PRINT "DID ";RG$(X);
2280 INPUT " PITCH A COMPLETE GAME? ";PS(X,4)
2290 FOR Y = 1 TO 6:PRINT TP$(Y);
2300 INPUT " ";GP(X,Y):NEXT Y:PRINT
2310 NEXT X:GOTO 190
2999 REM -- SHOW OR PRINT GAME STATS --
3000 HOME:IF P <> 0 THEN 3030
3010 PRINT "THERE ARE NO GAME STATISTICS TO PRINT."
3020 GOSUB 14000:GOTO 190
3030 HOME:INPUT "DO YOU WANT A PRINTOUT? ";HC$
3040 IF HC$ <> "Y" THEN 3090
3050 PRINT "PRESS <Y> WHEN PRINTER IS READY OR"
3060 PRINT "ANY OTHER KEY TO RETURN TO MAIN MENU."
3070 GET Z$:IF Z$ <> "Y" THEN 190
3080 PRINT:PRINT D$;"PR#1"
3090 HOME:PRINT TAB(16);"GAME STATISTICS"
3100 PRINT "DATE: ";DT$:PRINT "OPPONENT: ";OS
3110 PRINT "OPPONENT'S SCORE: ";OS
3120 PRINT "YOUR SCORE: ";YS
3130 IF IN = 0 THEN PRINT "NOT ";
3140 PRINT "INCORPORATED IN SEASON STATISTICS."
3150 GOSUB 15000
3160 FOR X = 1 TO P:X$ = LEFT$(RG$(X),8):PRINT X$;
3170 Y$ = STR$(GS(X,1))
3180 PRINT SPC(11-LEN(Y$)-LEN(X$));Y$;
3190 FOR Y = 2 TO 10:Y$ = STR$(GS(X,Y))
3200 PRINT SPC(3+(Y = 7)-LEN(Y$));Y$;
3210 NEXT Y:PRINT
3220 IF X = 15 AND HC$ <> "Y" THEN GOSUB 14000:HOME:GO
SUB 15000
3230 NEXT X:IF HC$ = "Y" THEN 3250
3240 GOSUB 14000
3250 HOME:GOSUB 16000
3260 FOR X = 1 TO P:IF PS(X,1) = "N" THEN 3350
3270 E = E+1:X$ = LEFT$(RG$(X),8):PRINT X$;
3280 PRINT SPC(12-LEN(PS(X,2))-LEN(X$));PS(X,2);
3290 FOR Y = 3 TO 4
3300 PRINT SPC(3-LEN(PS(X,Y)));PS(X,Y);NEXT Y
3310 Y$ = STR$(GP(X,1)):PRINT SPC(6-LEN(Y$));Y$;
3320 FOR Y = 2 TO 6:Y$ = STR$(GP(X,Y))
3330 PRINT SPC(3-LEN(Y$));Y$;NEXT Y:PRINT
3340 IF E = 15 AND HC$ <> "Y" THEN GOSUB 14000:HOME:GO
SUB 16000
3350 NEXT X:IF HC$ <> "Y" THEN PRINT:GOSUB 14000
3360 PRINT:PRINT D$;"PR#0":GOTO 190
3999 REM -- ADD GAME TO SEASON STATS --
4000 HOME:IN = 1:FL = 0
4010 PRINT TAB(3);"ADDING GAME STATS TO SEASON STATS"
4020 PRINT:PRINT "HOW MANY INNINGS IN A REGULAR"
4030 INPUT "GAME? ";CERA
4040 FOR X = 1 TO P:SS(NI(X),1) = SS(NI(X),1)+1
4050 FOR Y = 2 TO 11
4060 SS(NI(X),Y) = SS(NI(X),Y)+GS(X,Y-1):NEXT Y
4070 IF SS(NI(X),2) = 0 THEN 4120
4080 SS(NI(X),12) = INT(SS(NI(X),3)/SS(NI(X),2)*1000+0.5)/1000
4090 SS(NI(X),13) = 3*SS(NI(X),6)+2*SS(NI(X),5)+SS(NI(X),4)+SS(NI(X),3)
4100 SS(NI(X),13) = INT(SS(NI(X),13)/SS(NI(X),2)*1000+0.5)/1000
4110 SS(NI(X),14) = INT((SS(NI(X),9)+SS(NI(X),3))/(SS(NI(X),9)+SS(NI(X),2)*1000+0.5)/1000
4120 IF PS(X,1) = "N" THEN 4270
4130 IF PS(X,2) = "ND" THEN 4170
4140 IF PS(X,2) = "W" THEN SP(NI(X),1) = SP(NI(X),1)+1:GOTO 4170
4150 IF PS(X,2) = "L" THEN SP(NI(X),2) = SP(NI(X),2)+1:GOTO 4170
4160 SP(NI(X),3) = SP(NI(X),3)+1
4170 IF (SP(NI(X),1)+SP(NI(X),2)) = 0 THEN 4190
4180 SP(NI(X),4) = INT(SP(NI(X),1)/(SP(NI(X),1)+SP(NI(X),2))*1000+0.5)/1000
4190 SP(NI(X),6) = SP(NI(X),6)+1
4200 IF PS(X,3) = "Y" THEN SP(NI(X),7) = SP(NI(X),7)+1
4210 IF PS(X,4) = "Y" THEN SP(NI(X),8) = SP(NI(X),8)+1
4220 FOR Y = 9 TO 14
4230 SP(NI(X),Y) = SP(NI(X),Y)+GP(X,Y-8):NEXT Y
4240 IF SP(NI(X),9) = 0 THEN 4270
4250 SP(NI(X),5) = INT(CERA*SP(NI(X),12)/SP(NI(X),9)*1000+0.5)/1000
4260 IF GP(X,3) = 0 AND PS(X,4) = "Y" THEN SP(NI(X),15) = SP(NI(X),15)+1
4270 NEXT X:GOTO 190
4999 REM -- PRINT SEASON STATS --
5000 HOME:PRINT "PRESS <Y> WHEN PRINTER IS READY OR"
5010 PRINT "ANY OTHER KEY TO RETURN TO MENU."
5020 GET Z$:IF Z$ <> "Y" THEN 190
5030 PRINT:PRINT D$;"PR#1"
5040 HOME:PRINT TAB(32);"SEASON STATISTICS"
5050 PRINT:PRINT TAB(36);"BATTING"
5060 PRINT "NAME";SPC(8);"G AB H 2B 3B HR R RBI";
5070 PRINT "BB SO SB BA SA OBP"
5080 FOR X = 1 TO NP:X$ = LEFT$(RS$(X),10):PRINT X$;
5090 Y$ = STR$(SS(X,1))
5100 PRINT SPC(13-LEN(Y$)-LEN(X$));Y$;
5110 FOR Y = 2 TO 14
5120 Y$ = STR$(SS(X,Y)):IF Y > 11 THEN GOSUB 17000
5130 PRINT SPC(B(Y)-LEN(Y$));Y$;
5140 NEXT Y:PRINT:NEXT X
5150 PRINT:PRINT:PRINT TAB(36);"PITCHING"
5160 PRINT "NAME";SPC(8);"W L SV PCT ERA G GS";
5170 PRINT "CG IP H R ER BB SO SHO"
5180 FOR X = 1 TO NP:IF SP(X,6) = 0 THEN 5270
5190 X$ = LEFT$(RS$(X),10):PRINT X$;
5200 Y$ = STR$(SP(X,1))

```


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SPORTS MANAGEMENT PROGRAM

```

5210 PRINT SPC(13-LEN(Y$)-LEN(X$));Y$;
5220 FOR Y = 2 TO 15:Y$ = STR$(SP(X,Y))
5230 IF Y = 4 OR Y = 5 OR Y = 9 THEN GOSUB 17000
5240 IF Y = 5 OR Y = 9 THEN Y$ = LEFT$(Y$,LEN(Y$)-1)
5250 PRINT SPC(C(Y)-LEN(Y$));Y$;
5260 NEXT Y:PRINT
5270 NEXT X:PRINT:PRINT D$;"PR#0":GOTO 190
5999 REM -- CATALOG --
6000 HOME:PRINT D$;"CATALOG":PRINT
6010 GOSUB 14000:PRINT:GOTO 270
6999 REM -- LOAD GAME STATS --
7000 INPUT "ENTER FILE NAME: ";F$
7010 PRINT D$;"OPEN";F$:PRINT D$;"READ";F$
7020 INPUT P:INPUT DT$:INPUT OS
7030 INPUT OS:INPUT Y$:INPUT IN
7040 FOR X = 1 TO P:INPUT RG$(X):INPUT NI(X)
7050 FOR Y = 1 TO 10:INPUT GS(X,Y):NEXT Y
7060 FOR Y = 1 TO 4:INPUT PS(X,Y):NEXT Y
7070 FOR Y = 1 TO 6:INPUT GP(X,Y):NEXT Y
7080 NEXT X:PRINT D$;"CLOSE";F$:GOTO 190
7999 REM -- SAVE GAME STATS --
8000 FL = 1:INPUT "ENTER FILE NAME: ";F$
8010 PRINT D$;"OPEN";F$:PRINT D$;"WRITE";F$
8020 PRINT P:PRINT DT$:PRINT OS
8030 PRINT OS:PRINT Y$:PRINT IN
8040 FOR X = 1 TO P:PRINT RG$(X):PRINT NI(X)
8050 FOR Y = 1 TO 10:PRINT GS(X,Y):NEXT Y
8060 FOR Y = 1 TO 4:PRINT PS(X,Y):NEXT Y
8070 FOR Y = 1 TO 6:PRINT GP(X,Y):NEXT Y
8080 NEXT X:PRINT D$;"CLOSE";F$:GOTO 190
8999 REM -- QUIT --
9000 HOME:IF FL = 1 THEN 9050
9010 PRINT "THE GAME STATISTICS WERE NOT SAVED."
9020 PRINT "TYPE <1> FOR ANOTHER CHANCE TO SAVE,"
9030 PRINT "OR TYPE <2> TO QUIT."
9040 INPUT " ";Z:ON Z GOTO 270,9050:GOTO 9040
9050 POKE 216,0:ONERR GOTO 13000
9060 PRINT D$;"OPEN SEASON":PRINT D$;"WRITE SEASON"
9070 PRINT NP:FOR X = 1 TO NP:PRINT RS$(X)
9080 FOR Y = 1 TO 14:PRINT SS(X,Y):NEXT Y
9090 FOR Y = 1 TO 15:PRINT SP(X,Y):NEXT Y
9100 NEXT X:PRINT D$;"CLOSE SEASON":END
9999 REM -- ERROR CHECKING ROUTINES --
10000 PRINT "CAN'T FIND ROSTER AND SEASON"
10010 PRINT "STATISTICS. IF ROSTER AND SEASON"
10020 PRINT "STATISTICS EXIST, CHECK DISK AND"
10030 PRINT "TRY AGAIN. TYPE <1> TO CREATE A"
10040 PRINT "NEW ROSTER OR <2> TO TRY AGAIN."
10050 INPUT " ";Z:ON Z GOTO 1000,1300:GOTO 10050
11000 PRINT "I/O ERROR. CHECK DISK AND DISK DRIVE."
11010 GOSUB 14000:GOTO 270
12000 RESUME
13000 PRINT "DID NOT SAVE ROSTER AND SEASON"
13010 PRINT "STATISTICS. CHECK DISK DRIVE."
13020 GOSUB 14000:GOTO 10000
13999 REM -- ANY KEY SUBROUTINE --
14000 PRINT TAB(7);"PRESS ANY KEY TO CONTINUE."
14010 GET Z$:RETURN
14999 REM -- SUBROUTINE TO PRINT BATTING TITLES --
15000 PRINT:PRINT TAB(16);"BATTING"
15010 PRINT "NAME";SPC(5);"AB H 2B 3B HR R RBI BB SO"
15020 PRINT "SB":RETURN
15999 REM -- SUBROUTINE TO PRINT PITCHING TITLES --
16000 E = 0:PRINT:PRINT TAB(16);"PITCHING"
16010 PRINT "NAME";SPC(5);"W/L ST CG IP H R ER BB"
16020 PRINT "SO":RETURN
16999 REM -- SUBROUTINE TO JUSTIFY STATS --
17000 TE = VAL(Y$):JS = ".000"
17010 IF TE = 0 THEN Y$ = JS:RETURN
17020 IF TE < 1 THEN RE$ = Y$:GOTO 17050
17030 RE = TE-INT(TE):RE$ = STR$(RE)
17040 IF RE = 0 THEN Y$ = Y$+JS:RETURN
17050 IF LEN(RE$) = 4 THEN RETURN
17060 Y$ = Y$+RIGHT$(JS,4-LEN(RE$)):RETURN
17999 REM -- MENU DATA --

```

```

18000 DATA (1) ADD NAMES TO ROSTER
18010 DATA (2) ENTER GAME STATS
18020 DATA (3) SHOW OR PRINT GAME STATS
18030 DATA (4) ADD GAME TO SEASON STATS
18040 DATA (5) PRINT SEASON STATS,(6) DISK ACCESS
18050 DATA (7) QUIT,(1) CATALOG,(2) LOAD GAME STATS
18060 DATA (3) SAVE GAME STATS,(4) RETURN TO MAIN MENU
18999 REM -- BATTING DATA --
19000 DATA OFFICIAL AT BATS,TOTAL HITS,DOUBLES
19010 DATA TRIPLES,HOMERUNS,RUNS,RBI'S
19020 DATA WALKS,STRIKEOUTS,STOLEN BASES
19999 REM -- PITCHING DATA --
20000 DATA INNINGS PITCHED,HITS,RUNS,EARNED RUNS
20010 DATA WALKS,STRIKEOUTS
20999 REM -- SPACING DATA --
21000 DATA 0,3,4,3,3,3,3,4,3,3,6,6,6,6
21010 DATA 0,3,3,6,5,3,3,3,6,3,3,3,4,4,4

```

(NOTE: See modification for ProDOS, page 65.)

Commodore 64 & 128 (C 64 mode) w/disk drive & printer/Baseball Statistics

```

10 FL=1:QS=CHR$(34):PRINT CHR$(147);:POKE 649,10
20 DIM B(14),BMS(7),C(15),DMS(4),GP(30,6),GS(30,10)
30 DIM NI(30),PS(30,4),RG$(30),RS$(31),SP(30,15)
40 DIM SS(30,14),TBS(10),TPS(6)
50 FOR X=1 TO 7:READ BMS(X):NEXT X
60 FOR X=1 TO 4:READ DMS(X):NEXT X
70 FOR X=1 TO 10:READ TBS(X):NEXT X
80 FOR X=1 TO 6:READ TPS(X):NEXT X
90 FOR X=1 TO 14:READ B(X):NEXT X
100 FOR X=1 TO 15:READ C(X):NEXT X
110 SS="":FOR X=1 TO 40:SS=SS+"*":NEXT X
120 F$="0:SEASON,S":GOSUB 13000
130 IF ER<>0 THEN 10000
140 OPEN 2,8,2,F$+"R"
150 INPUT#2,NP:FOR X=1 TO NP:INPUT#2,RS$(X)
160 FOR Y=1 TO 14:INPUT#2,SS(X,Y):NEXT Y
170 FOR Y=1 TO 15:INPUT#2,SP(X,Y):NEXT Y
180 NEXT X:CLOSE 2
190 PRINT CHR$(147):PRINT SS:PRINT
200 PRINT TAB(10);"BASEBALL STATISTICS"
210 PRINT:FOR X=1 TO 7:PRINT SPC(7);BMS(X)
220 NEXT X:PRINT:PRINT SS
230 PRINT:GOSUB 16000:INPUT "SELECT: ";A
240 IF A<1 OR A>7 THEN 190
250 ON A GOTO 1000,2000,3000,4000,5000,260,9000
260 PRINT CHR$(147):PRINT SS:PRINT
270 PRINT TAB(15);"DISK ACCESS"
280 PRINT:FOR X=1 TO 4:PRINT SPC(9);DMS(X)
290 NEXT X:PRINT:PRINT SS
300 PRINT:GOSUB 16000:INPUT "SELECT: ";A
310 IF A<1 OR A>4 THEN 260
320 ON A GOTO 6000,7000,8000,190
999 REM -- ADD NAMES TO ROSTER --
1000 PRINT CHR$(147);"PRESS <RETURN> AFTER EACH NAME"
1010 PRINT "PRESS <RETURN> AFTER ENTERING"
1020 PRINT "THE FINAL NAME.":PRINT
1030 N=NP
1040 N=N+1:GOSUB 16000:INPUT "NAME: ";RS$(N)
1050 IF RS$(N)="" THEN 1090
1060 IF N>31 THEN 1040
1070 PRINT "YOU HAVE REACHED THE LIMIT."
1080 GOSUB 14000
1090 PRINT:FOR X=NP+1 TO N:PRINT RS$(X):NEXT X
1100 PRINT "IS IT CORRECT? ";
1110 GOSUB 15000:IF Z$<>"Y" AND Z$<>"N" THEN 1110
1120 PRINT Z$:IF Z$="Y" THEN NP=N-1:GOTO 190
1130 PRINT "REENTER ROSTER":GOTO 1030
1999 REM -- ENTER GAME STATS --
2000 IF FL=1 THEN 2050
2010 PRINT "THE GAME STATISTICS WERE NOT SAVED."
2020 PRINT "TYPE <1> FOR ANOTHER CHANCE TO SAVE,"
2030 PRINT "OR TYPE <2> TO CONTINUE."
2040 GOSUB 16000:INPUT Z:ON Z GOTO 260,2050:GOTO 2040

```



```

2050 PRINT CHR$(147);:IN=0:FL=0
2060 GOSUB 16000:INPUT "DATE: ";DT$
2070 GOSUB 16000:INPUT "OPPONENT: ";OS
2080 GOSUB 16000:INPUT "OPPONENT'S SCORE: ";OS
2090 GOSUB 16000:INPUT "YOUR SCORE: ";YS
2100 P=0:FOR X=1 TO NP:PRINT "DID ";RS$(X);
2110 PRINT " PLAY? ";
2120 GOSUB 15000:IF Z$<>"Y" AND Z$<>"N" THEN 2120
2130 PRINT Z$:IF Z$="N" THEN 2200
2140 PRINT CHR$(147);"ENTER STATS FOR ";RS$(X);"."
2150 PRINT "LIMIT STATS TO THREE DIGITS."
2160 PRINT:P=P+1:RG$(P)=RS$(X):NI(P)=X
2170 FOR Y=1 TO 10:PRINT TBS(Y);": ";
2180 GOSUB 16000:INPUT GS(P,Y)
2190 NEXT Y:PRINT
2200 NEXT X:PRINT CHR$(147);
2210 FOR X=1 TO P:PRINT "DID ";RG$(X);
2220 PRINT " PITCH? ";
2230 GOSUB 15000:IF Z$<>"Y" AND Z$<>"N" THEN 2230
2240 PRINT Z$:PS(X,1)=Z$:IF PS(X,1)="N" THEN 2340
2250 PRINT CHR$(147);"ENTER PITCHER STATS FOR ";RG$(X);
2260 PRINT "WHAT WAS THE DECISION?":GOSUB 16000
2270 INPUT "ENTER ND, W, L, OR SV. ";PS(X,2)
2280 PRINT "DID THIS PITCHER START"
2290 INPUT "THE GAME":PS(X,3):PRINT "DID ";RG$(X);
2300 INPUT " PITCH A COMPLETE GAME":PS(X,4)
2310 FOR Y=1 TO 6:PRINT TP$(Y);": ";
2320 GOSUB 16000:INPUT GP(X,Y)
2330 NEXT Y:PRINT
2340 NEXT X:GOTO 190
2999 REM -- SHOW OR PRINT GAME STATS --
3000 PRINT CHR$(147);:IF P<0 THEN 3030
3010 PRINT "THERE ARE NO GAME STATISTICS TO PRINT."
3020 GOSUB 14000:GOTO 190
3030 PRINT CHR$(147);
3040 INPUT "DO YOU WANT A PRINTOUT":HCS
3050 IF HCS="N" THEN OPEN 4,3:GOTO 3100
3060 PRINT "PRESS <Y> WHEN PRINTER IS READY OR"
3070 PRINT "ANY OTHER KEY TO RETURN TO MAIN MENU."
3080 GOSUB 15000:IF Z$<>"Y" THEN 190
3090 OPEN 4,4
3100 PRINT CHR$(147):PRINT#4,TAB(16);"GAME STATISTICS"
3110 PRINT#4,"DATE: ";DT$:PRINT#4,"OPPONENT: ";OS
3120 PRINT#4,"OPPONENT'S SCORE: ";OS
3130 PRINT#4,"YOUR SCORE: ";YS
3140 IF IN=0 THEN PRINT#4,"NOT ";
3150 PRINT#4,"INCORPORATED IN SEASON STATISTICS."
3160 GOSUB 17000
3170 FOR X=1 TO P:X$=LEFT$(RG$(X),8):PRINT#4,X$;
3180 Y$=STR$(GS(X,1))
3190 PRINT#4,SPC(11-LEN(Y$)-LEN(X$));Y$;
3200 FOR Y=2 TO 10:Y$=STR$(GS(X,Y))
3210 PRINT#4,SPC(3-(Y=7)-LEN(Y$));Y$;
3220 NEXT Y:PRINT#4
3230 IF X=15 AND HCS<>"Y" THEN GOSUB 14000:PRINT CHR$(147);:GOSUB 17000
3240 NEXT X:IF HCS="Y" THEN 3260
3250 GOSUB 14000
3260 PRINT CHR$(147);:GOSUB 18000
3270 FOR X=1 TO P:IF PS(X,1)="N" THEN 3360
3280 E=E+1:X$=LEFT$(RG$(X),8):PRINT#4,X$;
3290 PRINT#4,SPC(12-LEN(PS(X,2))-LEN(X$));PS(X,2);
3300 FOR Y=3 TO 4
3310 PRINT#4,SPC(3-LEN(PS(X,Y)));PS(X,Y);:NEXT Y
3320 Y$=STR$(GP(X,1)):PRINT#4,SPC(6-LEN(Y$));Y$;
3330 FOR Y=2 TO 6:Y$=STR$(GP(X,Y))
3340 PRINT#4,SPC(3-LEN(Y$));Y$;:NEXT Y:PRINT#4
3350 IF E=15 AND HCS<>"Y" THEN GOSUB 14000:PRINT CHR$(147);:GOSUB 18000
3360 NEXT X:IF HCS<>"Y" THEN PRINT#4:GOSUB 14000
3370 CLOSE 4:GOTO 190
3999 REM -- ADD GAME TO SEASON STATS --
4000 PRINT CHR$(147);:IN=1:FL=0
4010 PRINT TAB(3);"ADDING GAME STATS TO SEASON STATS"

```

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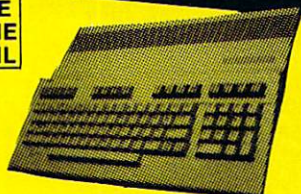
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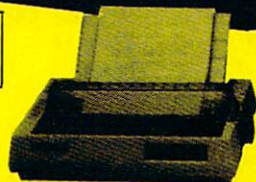


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SPORTS MANAGEMENT PROGRAM

```

4020 PRINT:PRINT "HOW MANY INNINGS IN A REGULAR"
4030 INPUT "GAME";CERA
4040 FOR X=1 TO P:SS(NI(X),1)=SS(NI(X),1)+1
4050 FOR Y=2 TO 11
4060 SS(NI(X),Y)=SS(NI(X),Y)+GS(X,Y-1):NEXT Y
4070 IF SS(NI(X),2)=0 THEN 4130
4080 SS(NI(X),12)=INT(SS(NI(X),3)/SS(NI(X),2)*1000+.5)
/1000
4090 SS(NI(X),13)=3*SS(NI(X),6)+2*SS(NI(X),5)+SS(NI(X),
4)+SS(NI(X),3)
4100 SS(NI(X),13)=INT(SS(NI(X),13)/SS(NI(X),2)*1000+.5)
/1000
4110 SS(NI(X),14)=(SS(NI(X),9)+SS(NI(X),3))/(SS(NI(X),
9)+SS(NI(X),2))
4120 SS(NI(X),14)=INT(SS(NI(X),14)*1000+.5)/1000
4130 IF PS(X,1)="N" THEN 4270
4140 IF PS(X,2)="ND" THEN 4180
4150 IF PS(X,2)="W" THEN SP(NI(X),1)=SP(NI(X),1)+1:GOT
O 4180
4160 IF PS(X,2)="L" THEN SP(NI(X),2)=SP(NI(X),2)+1:GOT
O 4180
4170 SP(NI(X),3)=SP(NI(X),3)+1
4180 IF (SP(NI(X),1)+SP(NI(X),2))=0 THEN 4200
4190 SP(NI(X),4)=INT(SP(NI(X),1)/(SP(NI(X),1)+SP(NI(X),
2))*1000+.5)/1000
4200 SP(NI(X),6)=SP(NI(X),6)+1
4210 IF PS(X,3)="Y" THEN SP(NI(X),7)=SP(NI(X),7)+1
4220 IF PS(X,4)="Y" THEN SP(NI(X),8)=SP(NI(X),8)+1
4230 FOR Y=9 TO 14:SP(NI(X),Y)=SP(NI(X),Y)+GP(X,Y-8)
4240 NEXT Y:IF SP(NI(X),9)=0 THEN 4270
4250 SP(NI(X),5)=INT(CERA*SP(NI(X),12)/SP(NI(X),9)*100
0+.5)/1000
4260 IF GP(X,3)=0 AND PS(X,4)="Y" THEN SP(NI(X),15)=SP
(NI(X),15)+1
4270 NEXT X:GOTO 190
4999 REM -- PRINT SEASON STATS --
5000 PRINT CHR$(147);"PRESS <Y> WHEN PRINTER IS READY"
5010 PRINT "OR ANY OTHER KEY TO RETURN TO MENU."
5020 GOSUB 15000:IF Z<>"Y" THEN 190
5030 OPEN 4,4:PRINT#4,TAB(32);"SEASON STATISTICS"
5040 PRINT#4:PRINT#4,TAB(36);"BATTING"
5050 PRINT#4,"NAME";SPC(8);"G AB H 2B 3B HR R RBI";
5060 PRINT#4,"BB SO SB BA SA OBP"
5070 FOR X=1 TO NP:X$=LEFT$(RS$(X),10):PRINT#4,X$;
5080 Y$=STR$(SS(X,1))
5090 PRINT#4,SPC(13-LEN(Y$)-LEN(X$));Y$;
5100 FOR Y=2 TO 14
5110 Y$=STR$(SS(X,Y)):IF Y>11 THEN GOSUB 19000
5120 PRINT#4,SPC(B(Y)-LEN(Y$));Y$;
5130 NEXT Y:PRINT#4:NEXT X
5140 PRINT#4:PRINT#4:PRINT#4,TAB(36);"PITCHING"
5150 PRINT#4,"NAME";SPC(8);"W L SV PCT ERA G GS";
5160 PRINT#4,"CG IP H R ER BB SO SHO"
5170 FOR X=1 TO NP:IF SP(X,6)=0 THEN 5260
5180 X$=LEFT$(RS$(X),10):PRINT#4,X$;
5190 Y$=STR$(SP(X,1))
5200 PRINT#4,SPC(13-LEN(Y$)-LEN(X$));Y$;
5210 FOR Y=2 TO 15:Y$=STR$(SP(X,Y))
5220 IF Y=4 OR Y=5 OR Y=9 THEN GOSUB 19000
5230 IF Y=5 OR Y=9 THEN Y$=LEFT$(Y$,LEN(Y$)-1)
5240 PRINT#4,SPC(C(Y)-LEN(Y$));Y$;
5250 NEXT Y:PRINT#4
5260 NEXT X:CLOSE 4:GOTO 190
5999 REM -- CATALOG --
6000 F=0:CLOSE 2:OPEN 2,8,0,"S":CLOSE 2
6010 CLOSE 15:OPEN 15,8,15:INPUT#15,ER,ER$:CLOSE 15
6020 PRINT CHR$(147);IF ER<>0 THEN 11000
6030 OPEN 2,8,0,"S":PRINT "DISK NAME: ";
6040 GET#2,T$:IF T$=CHR$(199) THEN CLOSE 2:GOTO 6080
6050 IF T$=CHR$(34) THEN F=NOT F:ON ABS(F) GOTO 6040:P
RINT:GOTO 6040
6060 IF F THEN PRINT T$;
6070 GOTO 6040
6080 GOSUB 14000:PRINT:GOTO 260
6999 REM -- LOAD GAME STATS --

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7000 GOSUB 16000:INPUT "ENTER FILE NAME: ";FS
7010 FS="0:"FS+";S":GOSUB 13000
7020 IF ER<>0 THEN 11000
7030 OPEN 2,8,2,FS+",R"
7040 INPUT#2,P:INPUT#2,DTS:INPUT#2,OS
7050 INPUT#2,OS:INPUT#2,Y$;INPUT#2,IN
7060 FOR X=1 TO P:INPUT#2,RS$(X):INPUT#2,NI(X)
7070 FOR Y=1 TO 10:INPUT#2,GS(X,Y):NEXT Y
7080 FOR Y=1 TO 4:INPUT#2,PS(X,Y):NEXT Y
7090 FOR Y=1 TO 6:INPUT#2,GP(X,Y):NEXT Y
7100 NEXT X:CLOSE 2:GOTO 190
7999 REM -- SAVE GAME STATS --
8000 FL=1:GOSUB 16000:INPUT "ENTER FILE NAME: ";FS
8010 FS="0:"FS+";S":GOSUB 13000
8020 IF ER<>0 AND ER<62 THEN 11000
8030 IF ER=0 THEN FS="0:"FS+";S"
8040 OPEN 2,8,2,FS+",W"
8050 PRINT#2,P:PRINT#2,DTS:PRINT#2,OS
8060 PRINT#2,OS:PRINT#2,Y$:PRINT#2,IN
8070 FOR X=1 TO P:PRINT#2,RS$(X);QS:PRINT#2,NI(X)
8080 FOR Y=1 TO 10:PRINT#2,GS(X,Y):NEXT Y
8090 FOR Y=1 TO 4:PRINT#2,PS(X,Y);QS:NEXT Y
8100 FOR Y=1 TO 6:PRINT#2,GP(X,Y):NEXT Y
8110 NEXT X:CLOSE 2:GOTO 190
8999 REM -- QUIT --
9000 PRINT CHR$(147);IF FL=1 THEN 9050
9010 PRINT "THE GAME STATISTICS WERE NOT SAVED."
9020 PRINT "TYPE <1> FOR ANOTHER CHANCE TO SAVE,"
9030 PRINT "OR TYPE <2> TO QUIT."
9040 GOSUB 16000:INPUT Z:ON Z GOTO 260,9050:GOTO 9040
9050 FS="0:SEASON,S":GOSUB 13000
9060 IF ER<>0 AND ER<62 THEN 12000
9070 IF ER=0 THEN FS="0:"FS+";S"
9080 OPEN 2,8,2,FS+",W"
9090 PRINT#2,NP:FOR X=1 TO NP:PRINT#2,RS$(X);QS
9100 FOR Y=1 TO 14:PRINT#2,SS(X,Y):NEXT Y
9110 FOR Y=1 TO 15:PRINT#2,SP(X,Y):NEXT Y
9120 NEXT X:CLOSE 2:END
9999 REM -- ERROR CHECKING ROUTINES --
10000 PRINT "CAN'T FIND ROSTER AND SEASON"
10010 PRINT "STATISTICS. IF ROSTER AND SEASON"
10020 PRINT "STATISTICS EXIST, CHECK DISK AND"
10030 PRINT "TRY AGAIN. TYPE <1> TO CREATE A
10040 PRINT "NEW ROSTER OR <2> TO TRY AGAIN."
10050 GOSUB 16000:INPUT Z
10060 ON Z GOTO 1000,1200:GOTO 10050
11000 PRINT "I/O ERROR. CHECK DISK AND DISK DRIVE."
11010 GOSUB 14000:GOTO 260
12000 PRINT "DID NOT SAVE ROSTER AND SEASON"
12010 PRINT "STATISTICS. CHECK DISK DRIVE."
12020 GOSUB 14000:GOTO 9080
12999 REM -- ERROR CHECKING SUBROUTINE --
13000 CLOSE 2:OPEN 2,8,2,FS+",R":CLOSE 2
13010 CLOSE 15:OPEN 15,8,15:INPUT#15,ER,ER$:CLOSE 15
13020 RETURN
13999 REM -- ANY KEY SUBROUTINE --
14000 PRINT TAB(7);"PRESS ANY KEY TO CONTINUE."
14010 GOSUB 15000:RETURN
14999 REM -- INPUT SUBROUTINE --
15000 GET Z$:IF Z$="" THEN 15000
15010 Z=ASC(Z$):Z$=CHR$(Z-32*(Z>96)*(Z<123))
15020 RETURN
16000 POKE 198,4:POKE 631,20:POKE 632,20
16010 POKE 633,32:POKE 634,32:RETURN
16999 REM -- SUBROUTINE TO PRINT BATTING TITLES --
17000 PRINT#4:PRINT#4,TAB(16);"BATTING"
17010 PRINT#4,"NAME";SPC(5);"AB H 2B 3B HR R RBI BB
SO SB":RETURN
17999 REM -- SUBROUTINE TO PRINT PITCHING TITLES --
18000 E=0:PRINT#4:PRINT#4,TAB(16);"PITCHING"
18010 PRINT#4,"NAME";SPC(5);"W/L ST CG IP H R ER
BB SO":RETURN
18999 REM -- SUBROUTINE TO JUSTIFY STATS --
19000 TE=VAL(Y$):JS="000"
19010 IF TE=0 THEN Y$=JS:RETURN

```



```

19020 IF TE<1 THEN RES=Y$:GOTO 19050
19030 RE=TE-INT(TE):RES=STR$(RE)
19040 IF RE=0 THEN Y$=Y$+J$:RETURN
19050 IF LEN(RES)>4 THEN RETURN
19060 Y$=Y$+RIGHT$(J$,5-LEN(RES)):RETURN
19999 REM -- MENU DATA --
20000 DATA (1) ADD NAMES TO ROSTER
20010 DATA (2) ENTER GAME STATS
20020 DATA (3) SHOW OR PRINT GAME STATS
20030 DATA (4) ADD GAME TO SEASON STATS
20040 DATA (5) PRINT SEASON STATS,(6) DISK ACCESS
20050 DATA (7) QUIT,(1) CATALOG,(2) LOAD GAME STATS
20060 DATA (3) SAVE GAME STATS,(4) RETURN TO MAIN MENU
20999 REM -- BATTING DATA --
21000 DATA OFFICIAL AT BATS,TOTAL HITS,DOUBLES
21010 DATA TRIPLES,HOME RUNS,RUNS,RBI'S
21020 DATA WALKS,STRIKEOUTS,STOLEN BASES
21999 REM -- PITCHING DATA --
22000 DATA INNINGS PITCHED,HITS,RUNS,EARNED RUNS
22010 DATA WALKS,STRIKEOUTS
22999 REM -- SPACING DATA --
23000 DATA 0,3,4,3,3,3,3,4,3,3,6,6,6
23010 DATA 0,3,3,6,5,3,3,6,3,3,3,4,4,4

```

IBM PC & compatibles w/128K RAM, disk drive, & printer/Baseball Statistics

This program has been tested and found to work on the following computers and hardware configurations, using the BASICS shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome Printer Card, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```

10 KEY OFF:CLS:WIDTH 40:FL=1
20 DIM B(14),BMS(7),C(15),DMS(4),GP(30,6),GS(30,10)
30 DIM NI(30),PS(30,4),RG$(30),RSS(31),SP(30,15)
40 DIM SS(30,14),TBS(10),TPS(6)
50 FOR X=1 TO 7:READ BMS(X):NEXT X
60 FOR X=1 TO 4:READ DMS(X):NEXT X
70 FOR X=1 TO 10:READ TBS(X):NEXT X
80 FOR X=1 TO 6:READ TPS(X):NEXT X
90 FOR X=1 TO 14:READ B(X):NEXT X
100 FOR X=1 TO 15:READ C(X):NEXT X
110 SS=STRING$(40,"*")
120 ON ERROR GOTO 10000
130 OPEN "SEASON" FOR INPUT AS #1
140 INPUT#1,NP:FOR X=1 TO NP:INPUT#1,RSS(X)
150 FOR Y=1 TO 14:INPUT#1,SS(X,Y):NEXT Y
160 FOR Y=1 TO 15:INPUT#1,SP(X,Y):NEXT Y
170 NEXT X:CLOSE #1
180 CLS:ON ERROR GOTO 12000
190 PRINT:PRINT SS:PRINT
200 PRINT TAB(10);"BASEBALL STATISTICS"
210 PRINT:FOR X=1 TO 7:PRINT SPC(7);BMS(X)
220 NEXT X:PRINT:PRINT SS
230 PRINT:INPUT "SELECT: ",A
240 IF A<1 OR A>7 THEN 180
250 ON A GOTO 1000,2000,3000,4000,5000,260,9000
260 CLS:ON ERROR GOTO 11000
270 PRINT:PRINT SS:PRINT
280 PRINT TAB(15);"DISK ACCESS"
290 PRINT:FOR X=1 TO 4:PRINT SPC(9);DMS(X)
300 NEXT X:PRINT:PRINT SS
310 PRINT:INPUT "SELECT: ",A
320 IF A<1 OR A>4 THEN 260
330 ON A GOTO 6000,7000,8000,180
999 REM -- ADD NAMES TO ROSTER --
1000 CLS:PRINT "PRESS <RETURN> AFTER EACH NAME"
1010 PRINT "PRESS <RETURN> AFTER ENTERING"
1020 PRINT "THE FINAL NAME.":PRINT
1030 N=NP
1040 N=N+1:INPUT "NAME: ",RSS(N)
1050 IF RSS(N)="" THEN 1090
1060 IF N<>31 THEN 1040
1070 PRINT "YOU HAVE REACHED THE LIMIT."
1080 GOSUB 14000

```



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SPORTS MANAGEMENT PROGRAM

```

1090 PRINT:FOR X=NP+1 TO N:PRINT RS$(X):NEXT X
1100 PRINT "IS IT CORRECT? ";
1110 GOSUB 15000:IF Z$<>"Y" AND Z$<>"N" THEN 1110
1120 PRINT Z$
1130 IF Z$="Y" THEN NP=N-1:GOTO 180
1140 PRINT "REENTER ROSTER":GOTO 1030
1999 REM -- ENTER GAME STATS --
2000 IF FL=1 THEN 2050
2010 PRINT "THE GAME STATISTICS WERE NOT SAVED."
2020 PRINT "TYPE <1> FOR ANOTHER CHANCE TO SAVE,"
2030 PRINT "OR TYPE <2> TO CONTINUE. "
2040 INPUT " ",Z:ON Z GOTO 260,2050:GOTO 2040
2050 CLS:IN=0:FL=0:INPUT "DATE: ",DT$
2060 INPUT "OPPONENT: ",OS
2070 INPUT "OPPONENT'S SCORE: ",OS
2080 INPUT "YOUR SCORE: ",YS
2090 P=0:FOR X=1 TO NP:PRINT "DID ";RS$(X);
2100 PRINT " PLAY? ";
2110 GOSUB 15000:IF Z$<>"Y" AND Z$<>"N" THEN 2110
2120 PRINT Z$:IF Z$="N" THEN 2180
2130 CLS:PRINT "ENTER STATS FOR ";RS$(X);"."
2140 PRINT "LIMIT STATS TO THREE DIGITS."
2150 PRINT:P=P+1:RG$(P)=RS$(X):NI(P)=X
2160 FOR Y=1 TO 10:PRINT TB$(Y);
2170 INPUT " ",GS(P,Y):NEXT Y:PRINT
2180 NEXT X:CLS
2190 FOR X=1 TO P:PRINT "DID ";RG$(X);
2200 PRINT " PITCH? ";
2210 GOSUB 15000:IF Z$<>"Y" AND Z$<>"N" THEN 2210
2220 PRINT Z$:PS(X,1)=Z$:IF PS(X,1)="N" THEN 2310
2230 CLS:PRINT "ENTER PITCHER STATS FOR ";RG$(X);"."
2240 PRINT "WHAT WAS THE DECISION?"
2250 INPUT "ENTER ND, W, L, OR SV. ",PS(X,2)
2260 PRINT "DID THIS PITCHER START?"
2270 INPUT "THE GAME";PS(X,3):PRINT "DID ";RG$(X);
2280 INPUT " PITCH A COMPLETE GAME";PS(X,4)
2290 FOR Y=1 TO 6:PRINT TP$(Y);
2300 INPUT " ",GP(X,Y):NEXT Y:PRINT
2310 NEXT X:GOTO 180
2999 REM -- SHOW OR PRINT GAME STATS --
3000 CLS:IF P<>0 THEN 3030
3010 PRINT "THERE ARE NO GAME STATISTICS TO PRINT."
3020 GOSUB 14000:GOTO 180
3030 CLS:INPUT "DO YOU WANT A PRINTOUT";HC$
3040 IF HC$="N" THEN OPEN "SCRN:" FOR OUTPUT AS #1:GOT
O 3090
3050 PRINT "PRESS <Y> WHEN PRINTER IS READY OR"
3060 PRINT "ANY OTHER KEY TO RETURN TO MAIN MENU."
3070 GOSUB 15000:IF Z$<>"Y" THEN 180
3080 OPEN "LPT1:" FOR OUTPUT AS #1
3090 CLS:PRINT#1,TAB(16);"GAME STATISTICS"
3100 PRINT#1,"DATE: ";DT$:PRINT#1,"OPPONENT: ";OS
3110 PRINT#1,"OPPONENT'S SCORE: ";OS
3120 PRINT#1,"YOUR SCORE: ";YS
3130 IF IN=0 THEN PRINT#1,"NOT ";
3140 PRINT#1,"INCORPORATED IN SEASON STATISTICS."
3150 GOSUB 16000
3160 FOR X=1 TO P:X$=LEFT$(RG$(X),8):PRINT#1,X$;
3170 Y$=STR$(GS(X,1))
3180 PRINT#1,SPC(11-LEN(Y$)-LEN(X$));Y$;
3190 FOR Y=2 TO 10:Y$=STR$(GS(X,Y))
3200 PRINT#1,SPC(3-LEN(Y$)-LEN(X$));Y$;
3210 NEXT Y:PRINT#1,
3220 IF X=15 AND HC$<>"Y" THEN GOSUB 14000:CLS:GOSUB 1
6000
3230 NEXT X:IF HC$="Y" THEN 3250
3240 GOSUB 14000
3250 CLS:GOSUB 17000
3260 FOR X=1 TO P:IF PS(X,1)="N" THEN 3350
3270 E=E+1:X$=LEFT$(RG$(X),8):PRINT#1,X$;
3280 PRINT#1,SPC(12-LEN(PS(X,2))-LEN(X$));PS(X,2);
3290 FOR Y=3 TO 4
3300 PRINT#1,SPC(3-LEN(PS(X,Y)));PS(X,Y);NEXT Y
3310 Y$=STR$(GP(X,1)):PRINT#1,SPC(6-LEN(Y$));Y$;
3320 FOR Y=2 TO 6:Y$=STR$(GP(X,Y))

```

```

3330 PRINT#1,SPC(3-LEN(Y$));Y$;NEXT Y:PRINT#1,
3340 IF E=15 AND HC$<>"Y" THEN GOSUB 14000:CLS:GOSUB 1
7000
3350 NEXT X:IF HC$<>"Y" THEN PRINT#1,:GOSUB 14000
3360 CLOSE #1:GOTO 180
3999 REM -- ADD GAME TO SEASON STATS --
4000 CLS:IN=1:FL=0
4010 PRINT TAB(3);"ADDING GAME STATS TO SEASON STATS"
4020 PRINT:PRINT "HOW MANY INNINGS IN A REGULAR"
4030 INPUT "GAME";CERA
4040 FOR X=1 TO P:SS(NI(X),1)=SS(NI(X),1)+1
4050 FOR Y=2 TO 11
4060 SS(NI(X),Y)=SS(NI(X),Y)+GS(X,Y-1):NEXT Y
4070 IF SS(NI(X),2)=0 THEN 4120
4080 SS(NI(X),12)=INT(SS(NI(X),3)/SS(NI(X),2)*1000+.5)
/1000
4090 SS(NI(X),13)=3*SS(NI(X),6)+2*SS(NI(X),5)+SS(NI(X)
,4)+SS(NI(X),3)
4100 SS(NI(X),13)=INT(SS(NI(X),13)/SS(NI(X),2)*1000+.5
)/1000
4110 SS(NI(X),14)=INT((SS(NI(X),9)+SS(NI(X),3))/(SS(NI
(X),9)+SS(NI(X),2))*1000+.5)/1000
4120 IF PS(X,1)="N" THEN 4270
4130 IF PS(X,2)="ND" THEN 4170
4140 IF PS(X,2)="W" THEN SP(NI(X),1)=SP(NI(X),1)+1:GOT
O 4170
4150 IF PS(X,2)="L" THEN SP(NI(X),2)=SP(NI(X),2)+1:GOT
O 4170
4160 SP(NI(X),3)=SP(NI(X),3)+1
4170 IF (SP(NI(X),1)+SP(NI(X),2))=0 THEN 4190
4180 SP(NI(X),4)=INT(SP(NI(X),1)/(SP(NI(X),1)+SP(NI(X)
,2))*1000+.5)/1000
4190 SP(NI(X),6)=SP(NI(X),6)+1
4200 IF PS(X,3)="Y" THEN SP(NI(X),7)=SP(NI(X),7)+1
4210 IF PS(X,4)="Y" THEN SP(NI(X),8)=SP(NI(X),8)+1
4220 FOR Y=9 TO 14
4230 SP(NI(X),Y)=SP(NI(X),Y)+GP(X,Y-8):NEXT Y
4240 IF SP(NI(X),9)=0 THEN 4270
4250 SP(NI(X),5)=INT(CERA*SP(NI(X),12)/SP(NI(X),9)*100
0+.5)/1000
4260 IF GP(X,3)=0 AND PS(X,4)="Y" THEN SP(NI(X),15)=SP
(NI(X),15)+1
4270 NEXT X:GOTO 180
4999 REM -- PRINT SEASON STATS --
5000 CLS:PRINT "PRESS <Y> WHEN PRINTER IS READY OR"
5010 PRINT "ANY OTHER KEY TO RETURN TO MENU."
5020 GOSUB 15000:IF Z$<>"Y" THEN 180
5030 CLS:LPRINT TAB(32);"SEASON STATISTICS"
5040 LPRINT:LPRINT TAB(36);"BATTING"
5050 LPRINT "NAME";SPC(8);"G AB H 2B 3B HR R RBI";
5060 LPRINT " BB SO SB BA SA OBP"
5070 FOR X=1 TO NP:X$=LEFT$(RS$(X),10):LPRINT X$;
5080 Y$=STR$(SS(X,1))
5090 LPRINT SPC(13-LEN(Y$)-LEN(X$));Y$;
5100 FOR Y=2 TO 14
5110 Y$=STR$(SS(X,Y)):IF Y>11 THEN GOSUB 18000
5120 LPRINT SPC(B(Y)-LEN(Y$));Y$;
5130 NEXT Y:LPRINT:NEXT X
5140 LPRINT:LPRINT:LPRINT TAB(36);"PITCHING"
5150 LPRINT "NAME";SPC(8);"W L SV PCT ERA G GS";
5160 LPRINT " CG IP H R ER BB SO SHO"
5170 FOR X=1 TO NP:IF SP(X,6)=0 THEN 5260
5180 X$=LEFT$(RS$(X),10):LPRINT X$;
5190 Y$=STR$(SP(X,1))
5200 LPRINT SPC(13-LEN(Y$)-LEN(X$));Y$;
5210 FOR Y=2 TO 15:Y$=STR$(SP(X,Y))
5220 IF Y=4 OR Y=5 OR Y=9 THEN GOSUB 18000
5230 IF Y=5 OR Y=9 THEN Y$=LEFT$(Y$,LEN(Y$)-1)
5240 LPRINT SPC(C(Y)-LEN(Y$));Y$;
5250 NEXT Y:LPRINT
5260 NEXT X:GOTO 180
5999 REM -- CATALOG --
6000 CLS:FILES
6010 GOSUB 14000:PRINT:GOTO 260
6999 REM -- LOAD GAME STATS --

```



```

7000 INPUT "ENTER FILE NAME: ",FS
7010 OPEN FS FOR INPUT AS #1
7020 INPUT#1,P:INPUT#1,DTS:INPUT#1,OS
7030 INPUT#1,OS:INPUT#1,YS:INPUT#1,IN
7040 FOR X=1 TO P:INPUT#1,RS(X):INPUT#1,NI(X)
7050 FOR Y=1 TO 10:INPUT#1,GS(X,Y):NEXT Y
7060 FOR Y=1 TO 4:INPUT#1,PS(X,Y):NEXT Y
7070 FOR Y=1 TO 6:INPUT#1,GP(X,Y):NEXT Y
7080 NEXT X:CLOSE #1:GOTO 180
7100 FL=1:INPUT "ENTER FILE NAME: ",FS
7999 REM -- SAVE GAME STATS --
8000 FL=1:INPUT "ENTER FILE NAME: ",FS
8010 OPEN FS FOR OUTPUT AS #1
8020 WRITE#1,P:WRITE#1,DTS:WRITE#1,OS
8030 WRITE#1,OS:WRITE#1,YS:WRITE#1,IN
8040 FOR X=1 TO P:WRITE#1,RS(X):WRITE#1,NI(X)
8050 FOR Y=1 TO 10:WRITE#1,GS(X,Y):NEXT Y
8060 FOR Y=1 TO 4:WRITE#1,PS(X,Y):NEXT Y
8070 FOR Y=1 TO 6:WRITE#1,GP(X,Y):NEXT Y
8080 NEXT X:CLOSE #1:GOTO 180
8999 REM -- QUIT --
9000 CLS:IF FL=1 THEN 9050
9010 PRINT "THE GAME STATISTICS WERE NOT SAVED."
9020 PRINT "TYPE <1> FOR ANOTHER CHANCE TO SAVE,"
9030 PRINT "OR TYPE <2> TO QUIT. "
9040 INPUT "",Z:ON Z GOTO 260,9050:GOTO 9040
9050 ON ERROR GOTO 13000
9060 OPEN "SEASON" FOR OUTPUT AS #1
9070 WRITE#1,NP:FOR X=1 TO NP:WRITE#1,RS(X)
9080 FOR Y=1 TO 14:WRITE#1,SS(X,Y):NEXT Y
9090 FOR Y=1 TO 15:WRITE#1,SP(X,Y):NEXT Y
9100 NEXT X:CLOSE #1:END
9999 REM -- ERROR CHECKING ROUTINES --
10000 PRINT "CAN'T FIND ROSTER AND SEASON"
10010 PRINT "STATISTICS. IF ROSTER AND SEASON"
10020 PRINT "STATISTICS EXIST, CHECK DISK AND"
10030 PRINT "TRY AGAIN. TYPE <1> TO CREATE A"
10040 PRINT "NEW ROSTER OR <2> TO TRY AGAIN."
10050 INPUT "",Z:IF Z=1 THEN RESUME 1000
10060 IF Z=2 THEN RESUME 120
10070 GOTO 10050
11000 PRINT "I/O ERROR. CHECK DISK AND DISK DRIVE."
11010 GOSUB 14000: RESUME 260
12000 RESUME
13000 PRINT "DID NOT SAVE ROSTER AND SEASON"
13010 PRINT "STATISTICS. CHECK DISK DRIVE."
13020 GOSUB 14000:RESUME 9060
13999 REM -- ANY KEY SUBROUTINE --
14000 PRINT TAB(7);"PRESS ANY KEY TO CONTINUE."
14010 GOSUB 15000:RETURN
14999 REM -- INPUT SUBROUTINE --
15000 Z$=INKEY$:IF Z$="" THEN 15000
15010 Z=ASC(Z$):Z$=CHR$(Z-32*(Z>96)*(Z<123))
15020 RETURN
15999 REM -- SUBROUTINE TO PRINT BATTING TITLES --
16000 PRINT#1,:PRINT#1,TAB(16);"BATTING"
16010 PRINT#1,"NAME";SPC(5);"AB H 2B 3B HR R RBI BB
SO SB":RETURN
16999 REM -- SUBROUTINE TO PRINT PITCHING TITLES --
17000 E=0:PRINT#1,:PRINT#1,TAB(16);"PITCHING"
17010 PRINT#1,"NAME";SPC(5);"W/L ST CG IP H R ER
BB SO":RETURN
17999 REM -- SUBROUTINE TO JUSTIFY STATS --
18000 TE=VAL(Y$):J$="."
18010 IF TE=0 THEN Y$=J$:RETURN
18020 IF TE<1 THEN RE=Y$:GOTO 18050
18030 RE=TE-INT(TE):RE$=STR$(RE)
18040 IF RE=0 THEN Y$=Y$+J$:RETURN
18050 IF LEN(RE$)>4 THEN RETURN
18060 Y$=Y$+RIGHT$(J$,5-LEN(RE$)):RETURN
18999 REM -- MENU DATA --
19000 DATA (1) ADD NAMES TO ROSTER
19010 DATA (2) ENTER GAME STATS
19020 DATA (3) SHOW OR PRINT GAME STATS
19030 DATA (4) ADD GAME TO SEASON STATS

```

```

19040 DATA (5) PRINT SEASON STATS,(6) DISK ACCESS
19050 DATA (7) QUIT,(1) CATALOG,(2) LOAD GAME STATS
19060 DATA (3) SAVE GAME STATS,(4) RETURN TO MAIN MENU
19999 REM -- BATTING DATA --
20000 DATA OFFICIAL AT BATS,TOTAL HITS,DOUBLES
20010 DATA TRIPLES,HOME RUNS,RUNS,RBI'S
20020 DATA WALKS,STRIKEOUTS,STOLEN BASES
20999 REM -- PITCHING DATA --
21000 DATA INNINGS PITCHED,HITS,RUNS,EARNED RUNS
21010 DATA WALKS,STRIKEOUTS
21999 REM -- SPACING DATA --
22000 DATA 0,3,4,3,3,3,3,4,3,3,3,6,6,6
22010 DATA 0,3,3,6,5,3,3,3,6,3,3,3,4,4,4

```

MODIFICATION FOR PRODOS

Apple II series w/64K RAM, disk drive, printer, & ProDOS/Baseball Statistics

Use DOS 3.3 version, except change line 6000 to read as follows:

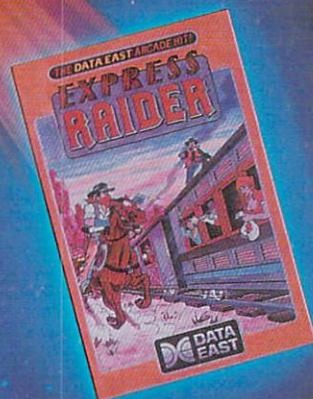
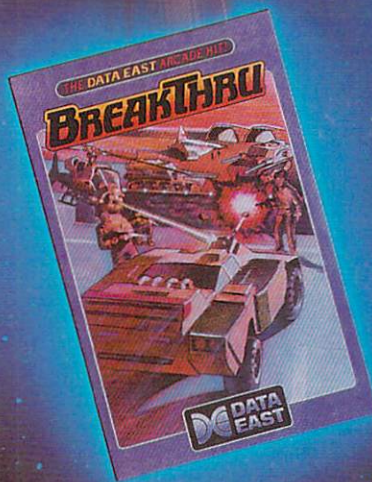
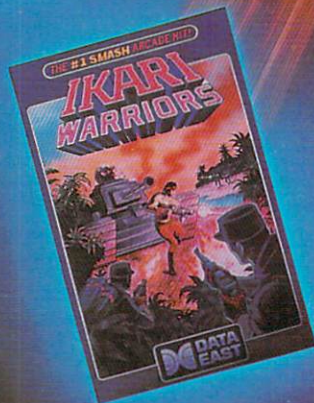
```
6000 HOME:PRINT DS;"CAT":PRINT
```

TIPS TO THE TYPIST

SOME GENERAL RULES

1. Read instructions and program headings carefully.
2. Don't let fatigue and boredom contribute to inaccuracy. If you're new to programming, type in a longer program in easy stages, saving each installment as you go.
3. Assume that every character in a program listing must be copied accurately if a program is to work.
4. Watch out for potential trouble spots. About 90 percent of all typing errors occur in DATA statements.
5. Be aware that our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press RETURN or ENTER before checking to see if the program "line" you're typing really ends there.
6. To correct an error in a BASIC program line, type the line in again from the beginning, and press RETURN or ENTER to replace the old line.

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CIRCLE READER SERVICE 13

K-POWER

Edited by Bernadette Grey

FOR THE COMPUTER GENERATION

The Tale Behind The Bard

Every now and then, without warning, our greatest enemy strikes: the computer game blues. It's the terrible feeling we get when we've played every game in our software library and need a new challenge. When the computer game blues hits the K-POWER office, it gets so quiet you can hear a cursor blink or a doorknob turn.

Wait a minute. I hear a doorknob turning. Who is it? It's a visitor carrying the sequel to the incredibly popular *The Bard's Tale*! Hurrah!! (Since we received our copy of the computer game, *The Bard's Tale II: The Destiny Knight* (Electronic Arts), we have barricaded ourselves in the FAMILY COMPUTING computer lab.)

The visitor mentioned was **Brian Fargo**, one of the people who designed the game. Twenty-three-year-old Brian, the president of Interplay Inc. (a software design company), likes to compare making a game to making a movie. Brian, as director, is in charge of developing a general concept and seeing that everything runs smoothly and on time. During a typical day, he has many dealings with the rest of his movie crew. There is an assistant director, an artist, a sound-effects expert, a special-effects expert, and even a star, who is most commonly the programmer.

The Bard's Tale II is an adventure that is likely to take more than one



Three cheers for the crew at Interplay!

hundred hours (!!!!) to solve. It has all the much-loved features of the original game plus a whole bunch of other goodies, including new monsters and spells, seven different cities (each with its own dungeon), treacherous wilderness, and seven deadly rooms.

To deliver a high degree of sophistication on just two disks, the programmers had to push the machines 'til they screamed. They filled every last bit of the disks with codes and arranged things so that there would be a minimum of disk-swapping.

As head of Interplay, Brian is part of a very close family. It was so hard to find the talent he wanted that it took three years to assemble his current group of game designers (who are all self-taught programmers). At

Interplay, everyone has his share of input and work to do on a game. Work hours are so flexible that some programmers will come in to work at 3 a.m. on a Sunday morning, dressed in bathrobes!

Brian says the folks at Interplay are currently working on something "very big." Whatever it is, we'll be looking forward to it. But right now, we have our hands full with *The Bard's Tale II: The Destiny Knight*.—SPECIAL K JEFF DONAHUE, 18, Bronx, New York

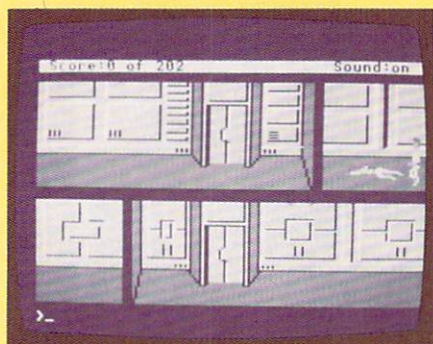
EDITOR'S NOTE: Amid the cries of victory and shrieks of despair coming from the computer lab, the FAMILY COMPUTING staff has heard the SPECIAL KS vow not to give up until one of them has become the *Destiny Knight*. Does this mean we have to open their mail?

STRATEGY

T I P S, T R I C K S, A N D H I N T S

SPACE QUEST

Sierra On-Line. Graphic adventure. Your mission: Thwart the evil Sarians in their attempt to use the stolen Star Generator. Then deliver their plans to the scientists who can save your solar system. (*The hints and game are for Amiga, Atari ST, IBM PC/PCjr & compatibles.*)



Find a pass card.

On the Arcada, you'll miss your chance to get a pass card if you pass by the deceased passengers and crew.

The mechanical spider looks simply smashing with a rock on its head. (Extra hint: Save the game and push the rock to see where it lands. Put a small piece of tape on

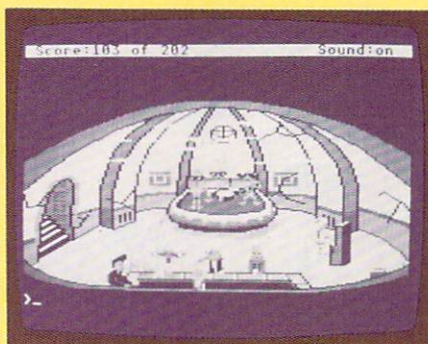
the screen to mark the spot where the rock fell. Restore the game and wait for the spider to walk over your mark.)

Dodging rocks on a skimmer is thirsty work. Have more than one drink at the bar.

Does the monster beneath the grate make you edgy?

The skimmer is worth more than 30 Buckazoids.

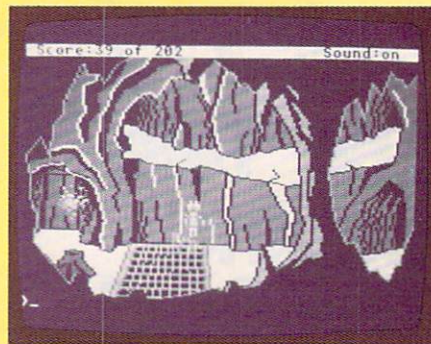
Don't forget that you have a discount coupon for Droids R Us.



Stop for a couple of drinks.

When playing the slot machine, use this good system for winning: Each time you win 10 Buckazoids, save the game. Every time you lose more than 10, restore it.

When your pod crashes on Kerona, examine your surroundings thoroughly before you get out. Also, examine the pod exterior from all sides.



Walk along the edge.

On the Sarien ship, get in the trunk and wait. The laundry machine can greatly affect your appearance.

In the Armory, give the robot the I.D. that you found on yourself and grab the grenade when the robot leaves. The grenade will help you get the drop on the Star Generator guard.—SPECIAL K JEFF DONAHUE, 18, Bronx, New York; TIM BLAKE, 13, Charlotte, North Carolina; CHRIS MAMMEN, 13, Bloomington, Minnesota

UNINVITED

Mindscape. Graphic adventure. Your mission: Escape from the mansion and save your little brother and the world from an evil satanic power. (*The hints and game are for Macintosh.*)

Reading other people's mail isn't polite, but it could save your life!

Check the upstairs closet for something to take care of Miss O'Hara. But be sure to open it before you use it.

The nightstand in the upstairs bedroom has a hollow ring to it.

The lamp in the servant's room does its job without electricity.

The servant won't let you read his diary, but if you could get him out of the way. . . .

Spray the Spider Cider on the railing on the veranda and leave the porch. Come back later, and the spider will be caught. Show the spider to the servant to scare him away.

Read the book in the master bedroom.

The key in the chair opens many things.

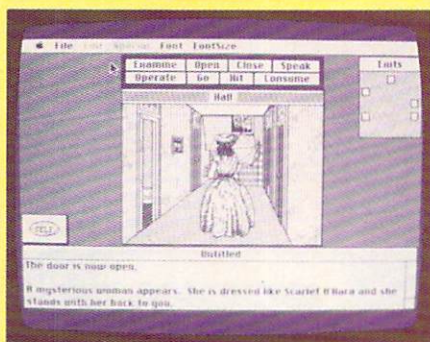
Some dogs are afraid of lightning (Instantum Illuminaris Abraxas).

Talking heads need conversation once in a while, so brush up on your Latin (Specan Heafod Abraxas).

A cross will come in handy later on, but the secret trap door under the altar is not the way to go.

The candelabra will protect you on your way to the maze. (Remember to light it.)

The amulet can take care of only one Zombie at a time, so if you run up against a bunch of them, run.



Take care of Miss O'Hara.

There is one grave here that is different from the others, and you have only one bunch of flowers.

The key from the chair will open the cages.

Cage the bird, and the snake and the cat will take care of each other.

The bouncing creature would just love a bird to play with. If you find the creature, it will leave the gem behind.

Put the gem in the gem-shaped hole in the magisterium doorway.

The guardian demon could probably use some fruit. Water the

one plant in the greenhouse that is not dead, and it will soon grow.

"Gold, silver, and mercury—together they form a key." Look in the study desk drawer and find the atomic numbers of these three elements. This is the combination to the safe.

Hack the cookie jar with the axe and leave the cookie in the house. The little guy will exchange the key for the cookie.

Light a fire in the entrance-hall fireplace and throw the hingeless box in the fire. The star will burn the ice under the trap door in the lab.

The spider kills. Avoid it.

Operate the star from the hingeless box on the ice and follow the evil genius.

Throw the evil genius down the bottomless pit before he wakes up. The key you got from the little guy unlocks the door to the house.

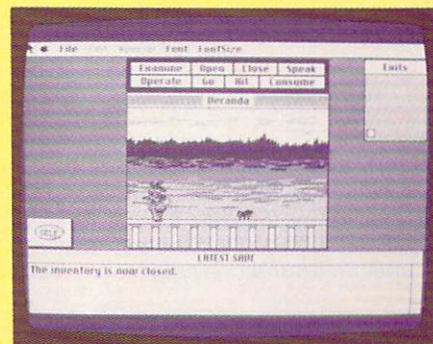
Your brother's screams are coming from above the upstairs bathroom with the odd light fixture.

Wait until the water almost fills the room, and open the fixture.

Your brother seems delirious. Smack some sense into him.

A simple wooden cross will take care of the demon.

Follow your brother out the window.



Kill the spider with cider.

Have you tried . . . Getting in the coffin in the maze?

Not caging one of the animals?

Entering the cage in the attic?

Eating the fruit from the plant in the greenhouse?

Drinking the mercury?

—THE SPECIAL KS

INFIDEL

Infocom. Text adventure. Your mission: To locate the pyramid, enter it and claim the treasure you find.

(The hints and game are for Amiga, Apple, Atari ST, Commodore 64/128, IBM PC & compatibles, and Macintosh.)

To get to the pyramid from the southern path, go east twice. Dig here until you find the entrance to the pyramid.

Place the stone cube from the trunk in the opening. This will open the pyramid.

When you get into the pyramid, tie your rope to the altar, and throw the loose end to the north.

Once you get into the circular room, move the statue, and take the head and the gold cluster. Roll the

statue northeast and then drop the head. Go southwest to the room of Isis and get the emerald cluster. Do the same in all four corners until you have all four jeweled clusters.

You'll need the mast from the barge chambers later on in the game, so remove the shim and get the mast.

Go to the panel with the bricks found in the southern part of the cube. Remove the first, third, and fifth bricks and the secret panel will appear.

Stand on the beam after placing it in the niches that are in the western end of the narrow passageway. Now you can safely remove the plaster.

Put the mast between the rocks in the antechamber and open the door. Put the diamond cluster in the first hole, the ruby cluster in the second hole, the emerald cluster in the third hole, and the opal cluster in the fourth. Lift the slab and take the book and spatula.

Put the mast under the timber, and then break the seals and open the door. Put the gold and silver chalices on the two empty disks on the left and right. Putting water in the silver chalice will help balance the scales, permitting you to get the scarab.

Place the book in the large recess and the scarab in the small recess. Carefully, turn the gods. Now you can remove the lid of the coffin.—SCOTT WAGNER, *Andover, Massachusetts*; ADAM NORTHRUP, *16, Dansville, New York*

NEW HARDWARE & ACCESSORIES

New Amiga Computer

EDITOR'S NOTE: This is a preview—not a review—based on a morning's visit to Commodore's New York office. Prices are estimates, and specifications are subject to change.

If you've kind of liked Commodore's Amiga up to now, but had enough reservations to keep your distance, you may develop a sweet fondness for the new Amiga 2000. They've kept all the good things, eliminated some annoyances, and added several improvements and welcome wrinkles.

Count among the good things the Amiga's superb graphics (up to 4,096 colors) and stereo sound (in four voices) with speech-synthesis capability. Then don't forget about the computer's multitasking, which lets you run more than one program simultaneously.

In the "eliminated" department, we'll shed no tears for the demise of the old Kickstart 1.1. The Amiga 2000 has the new version of Kickstart—1.2—in ROM (256K), so now you can start up directly with the Workbench disk. No longer will you have to insert separate Kickstart and Workbench disks before getting to whatever programs you want to use. Kickstart 1.2 also comes on disk for use on the original Amiga.

The central unit of the 2000 is not as sleek as that of the original 1000. Instead, it's a big gray box that reminded me of a number of PC clones. But you need a big box to hold all the improvements. Let's count off a few:

1. One megabyte of RAM is standard, expandable to a whopping nine megabytes.

2. Nine internal slots for add-on boards. Five accept boards designed for the Amiga, and four are compatible with the IBM PC standard. However, if you opt for PC compatibility, you must install a "bridge" card.

This specialized board occupies both an Amiga and an IBM slot, making one slot (either Amiga or IBM, depending on your setup) unusable. In effect, then, you have seven slots.

3. The Amiga Bridge board (\$500) transforms the Amiga into an MS-DOS compatible computer. This board goes into both types of slots simultaneously and contains 512K memory and an 8088 microprocessor. With this board installed, you can run the 2000 as an Amiga and an MS-DOS computer at the same time, each in its own window.

4. Two new slots: a separate video slot for composite video and Genlock (useful for connecting the computer to your VCR) and a 68000 bus slot (for adding a co-processor).

5. One built-in 3½" floppy disk drive (880K formatted), with room in the main unit for up to two of the following options: a second 3½" drive, a 5¼" drive (for use with the Amiga Bridge), or a hard disk drive.

6. You can also add several external floppy drives—three MS-DOS drives and two Amiga drives.

7. The keyboard has been made wider, and placement of the cursor keys has been improved.

8. Industry-standard serial and parallel connectors.

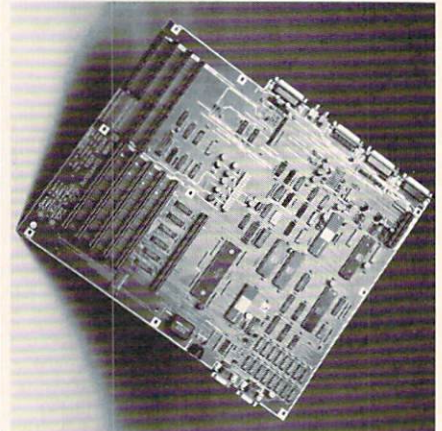
9. A large, 200-watt power supply, which allows you to fill up all slots with no power shortages.

The estimated price for the Amiga 2000 is \$1,495. That includes one megabyte RAM, one 3½" drive, the keyboard, and mouse. The RGB color monitor is extra, and you have two choices: either the original Amiga monitor (\$350) or a new, long-persistence monitor (\$500) that helps eliminate the flickering that often occurs in high-res mode.

Commodore is also introducing a second new computer, the Amiga 500. Here's the basic description the company supplied us with: Memory is



A first look at the Commodore Amiga 2000. In this configuration, there are two 3½" disk drives. Notice the rectangle beneath them; you could install either a 5¼" drive (for the MS-DOS compatibility) or a hard disk drive there.



The Amiga 2000's motherboard (this prototype is marked "Amiga 2500"). The five large slots on the bottom left can be filled with circuit boards designed just for the Amiga. The single slot on the upper right can be used for connecting the Amiga to a VCR.

512K, expandable internally to one megabyte, externally to nine megabytes. Unlike the 2000 or the original Amiga, the keyboard is built into the main unit, as is one 3½" drive; it looks a lot like the C 128. The 500 also has an external expansion connector. The computer's estimated price, without monitor, is \$649.

With both the Amiga 2000 and the Amiga 500 hitting the market in the first half of 1987, more new software packages than before should be available. If so, all our reservations could disappear, leaving only the fondness. —D.H.

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SOFTWARE GUIDE

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart. Unless otherwise noted, all programs are in disk format, and minimum memory requirements are 48K for Apple II series, 48K for Atari, 128K for IBM PC/PCjr or compatibles, and 128K for Macintosh. "Atari" alone denotes the 800/XL/XE series. "C 64/128" means the software will run on both a C 64 and a C 128 computer in C-64 mode; "C 128" alone means the software will run only on that machine.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system (in the games reviews), the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

EDUCATION/FUN LEARNING

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
HEALTH WATCH! Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$50 ©1985	Games that reinforce and test prior knowledge about proper nutrition, dental hygiene, and physical exercise. Not too engrossing, however. Best for ages 6-10, not older. —ZORNBERG	Apple. Color monitor recommended. Joystick, printer optional.	60-day warranty. \$12 for 10 months thereafter or for backup.	★	★	★	★	E	★
MATH RABBIT The Learning Company 545 Middlefield Road Menlo Park, CA 94025 (415) 328-5410 \$40 ©1986	Thoughtfully designed games for exploring numbers, grounded in an understanding of how kids learn math. But some of the game controls caused confusion at first. For ages 4-7. —ELTGROTH	Reviewed on 64K Apple. Also for IBM PC/PCjr.* Color monitor, joystick recommended.	90-day warranty. \$10 thereafter. 30-day money-back guarantee.	★	★	★	★	D	★
MIMI Logidisque, Inc. P.O. Box 485 Places D'Armes Postal Station Montreal, Quebec H2Y 3H3, Canada (514) 842-9551 \$35 ©1986	An animated, bilingual (French-English) alphabet book with music that includes folk tunes and excerpts from classical pieces. Kids (ages 2+) remain interested through repeated playbacks. Parents will need to help youngsters at first. —SUMMERS	Reviewed on 256K IBM PC/PCjr.* Also for C 64/128. Color monitor recommended.	90-day warranty. \$15 for backup.	★	★	★	★	E	★
THE PERFECT COLLEGE Mindscape, Inc. (see above for address and phone) \$20 ©1987	A data base that helps you identify four-year accredited colleges that meet your specifications. But manual doesn't offer strategies for conducting a useful search. —MORRIS	Reviewed on IBM PC/PCjr.* Also for 64K Apple, C 64/128, Macintosh.	90-day warranty. \$12.50 thereafter or for backup (\$15 for Macintosh).	★	★	★	NA	E	★
TERM PAPER WRITER Personal Choice/ Activision 2350 Bayshore Parkway Mountain View, CA 94043 (415) 960-0410 \$50-\$60 ©1986	Encourages students to concentrate on content instead of form in order to write effective papers. Helps them to organize their ideas, all footnotes, and a bibliography.† —SOLOMON	Reviewed on 128K Apple IIe/IIc. Also for C 128, 256K IBM PC/PCjr.* 2nd drive optional.	90-day warranty. \$10 thereafter. \$15 for backup.	★	★	★	NA	A	★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; **○** Poor; **★** Average; **★★** Good; **★★★** Very Good; **★★★★** Excellent; **N/A** Not applicable; **E** Easy; **A** Average; **D** Difficult; **†** Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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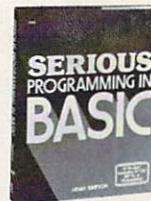
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1960 \$18.95



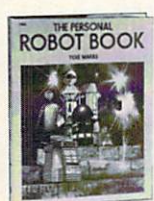
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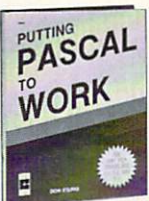
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1718P. Scuttle The Computer Pirates: Software Protection Schemes Paper \$15.50

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1969. Making Money with Your Microcomputer—2nd Edition \$16.95

2622. Supercomputers of Today and Tomorrow: The Parallel Processing Revolution \$21.95

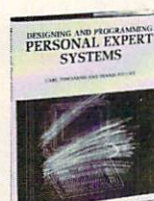
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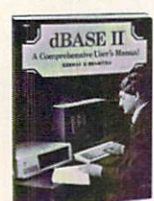
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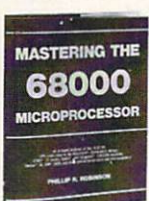
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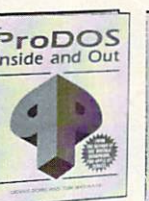
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HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
D.E.G.A.S. ELITE Batteries Included 30 Mural St. Richmond Hill, Ontario L4B 1B5, Canada (416) 881-9941 \$80 ©1986	Enhanced, second-generation graphics program offers drawing tools in staggering profusion, such as defining your own brushes, lines, and fill patterns. The manual might be a bit too technical for some tastes, however. —BRADLEY	Atari ST.	90-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
INSTANT MUSIC Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$50 ©1986	Music you paint rather than write. Notes are presented on-screen by colored blocks that you move to change the sound of 19 different instruments. Comes with over 40 tunes to edit and learn from.† —SUMMERS	512K Amiga.	90-day warranty. \$7.50 thereafter or for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
MONEYMATE RealWorld Corporation 282 Loudon Road Concord, NH 03301 (603) 798-5700 \$169 ©1986	A particularly well-organized financial management package designed with ordinary people, not amateur accountants, in mind. Comes in the biggest software box I've ever seen.† —MORGENSTERN	256K IBM PC.* 2nd drive. Color monitor, mouse optional.	90-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
MORE Living Videotext, Inc. 2432 Charleston Road Mountain View, CA 94043 (415) 964-6300 \$295 ©1986	An expanded, high-powered version of <i>ThinkTank</i> . If you like to work from lists and outlines, or if you often make presentations using flow- or tree-charts, then <i>More</i> has all you could ask for. —MORRIS	512K Macintosh. 2nd drive.	90-day warranty. \$25 for 1 year thereafter. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	D	★ ★ ★ ★
PFS: FIRST CHOICE Software Publishing Corp. 1901 Landings Drive Mountain View, CA 94039 (415) 962-8910 \$179 ©1986, 1987	By integrating a word processor, file manager, spreadsheet, and communications program into one package, the PFS people have come up with a winner for beginners, the average user, and small businesses.† —MORRIS	256K IBM PC.* 2nd drive recommended. Mouse optional.	90-day warranty. \$15 thereafter. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	NA	A	★ ★ ★ ★
POWER PRINT Beagle Bros, Inc. 3990 Old Town Ave. San Diego, CA 92110 (619) 296-6400 \$40 ©1986	Load new typefaces into your printer's memory, then use them when printing with your regular word processor, data base, or any other programs. Lets you design your own typefaces, too. —HALLERMAN	64K Apple. ImageWriter, Epson, Okidata, Panasonic, or Star printers.	Sold as is. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	NA	A	★ ★ ★ ★
TEMPO Affinity Microsystems, Ltd. 1050 Walnut St., #425 Boulder, CO 80302 (303) 442-4840 \$99 ©1985, 1986, 1987	Create macros (a series of commands rolled into one) for your Mac programs by recording your actions as you perform them, then playing them back as needed. Speeds up your work. —AKER	512K Macintosh. 800K drive(s) recommended.	90-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	NA	E	★ ★ ★ ★
THINKING CAP Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1700 \$50 ©1986	Outline-processing software for anyone who needs to plan and organize thoughts. Intended for adults, it's also suitable for students. Gives you three outline forms.† —SUMMERS	C 64/128.	90-day warranty. \$7.50 thereafter. \$10 for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	NA	A	★ ★ ★ ★
WORDS & FIGURES Lifetree Software Inc. 411 Pacific St. Monterey, CA 93940 (408) 373-4718 \$195 ©1986	Combines spreadsheet and word processor. Include sections of your spreadsheet in any document; when you change a figure, it's updated in both the spreadsheet and the document. —MORGENSTERN	256K IBM PC.* 2nd drive. Graphics card, 8087 or 80287 math co-processor optional.	90-day warranty and money-back guarantee. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	NA	A	★ ★ ★ ★

RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

The time: 1400 hours. Somewhere in the Pacific. Some ill-fated coordinates in World War II.



Damage Control reports a hit on the starboard side. Send in Alpha, Baker and Charlie to repair.

eyeball to eyeball action. This time around you'll be right in the middle of it all. You knew it wouldn't be pretty. But how tough could it be to rescue a downed pilot?

Will it be the twin 40mm Bofors aircraft anti-guns? Or the 5" lead-spewers aft? Depth charges or torpedoes? Autopilot or guts?

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Radar spots inbound Zeroes. Ready forward gunnery positions. Man the anti-aircraft turrets. They're coming.

You're at the helm, commanding the greatest concentration of firepower ever put in a lightweight fighter. The deadly Fletcher Class Destroyer. You've embarked on the first simulation that actually combines the intricate, large-scale strategy of wargaming with the intensity of furious,

It sure seemed a lot easier than shelling islands, escorting a convoy or hunting subs.

Or so you thought. But now look what you've got. Thirteen fully-operational, ear-bursting battle stations to worry about, all armed to the gills. Not to mention radar. Navigation. Sonar.

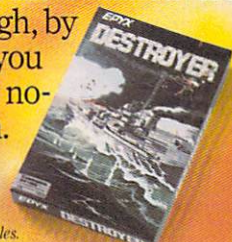
And half the Japanese fleet crawling up your spine. Time to make some tactical decisions.

Any choice could be your last, so make it good.

Suddenly, you hear the ominous rumble of incoming Zeroes. You fire, and send one plummeting to the sea, trailing a plume of smoke. On instinct, you instruct the bridge to commence evasive maneuvers.

Even though, by experience, you know there's nowhere to run.

EPYX
Apple II & compatibles.
C64/128, IBM & compatibles.



ENTERTAINMENT										
Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings						
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AIRHEART Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1700 \$35 ©1986	A hectic "shoot-'em-up and chase-'em-down" in which you fly a jet-powered sled into battle with robots at sea. Superior animation with convincing 3-D effects make it a thrill.† —ADDAMS	128K Apple IIe/IIc. Joystick. Color monitor recommended.	90-day warranty. \$7.50 thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	
COMMANDO Data East USA, Inc. 470 Needles Drive San Jose, CA 95112 (408) 286-7074 \$35-\$40 ©1986	Adapted from the hit arcade game. Your commando grapples with enemy soldiers, tanks, missiles, and more while crossing the battlefield to capture their headquarters. Frenetic fun for ages 7+ —ADDAMS	Reviewed on C 64/128. Also for Apple, IBM PC/PCjr.* Joystick(s).	90-day warranty.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★	
DESTINY Software Investments Plus P.O. Box 13 Appleton City, MO 64724 (816) 476-2580 \$25-\$45 ©1985	Slay a dragon to become King in this graphic adventure that uses a streamlined joystick interface. Lack of well-done graphics is a weak point. A good adventure for younger family members. —ADDAMS	Reviewed on C 64/128. Also for Apple, Macintosh. Joystick.	90-day warranty. \$7 thereafter.	★ ★	★ ★	★ ★	★ ★	E	★ ★	
DESTROYER Epyx, Inc. 600 Galveston Drive Redwood City, CA 94063 (415) 366-0606 \$40 ©1986	Captain a U.S. Navy destroyer in the Pacific in W.W. II. Issue commands to 12 different stations on board as you engage in air, sea, and subsurface combat. Variable difficulty levels. —DELSON	Reviewed on C 64/128. Also for Apple, IBM PC/PCjr.* Joystick.	90-day warranty. \$5 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
GEMSTONE HEALER Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1200 \$30 ©1986	Monsters await as you guide your character through a labyrinth to find the tools necessary to split the magic gemstone. You have to start over each time you die, though. Fast-paced. —DELSON	Reviewed on C 64/128. Also for Apple. Joystick optional.	30-day warranty. \$10 thereafter.	★ ★	★ ★	★ ★	★ ★	A	★ ★	
INDOOR SPORTS Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$30 ©1987	Coordinate various hand-eye skills as you bowl, throw darts, and play air hockey or Ping-Pong. Not an easy collection to master, but it's lots of fun getting there. Up to 4 can play; for ages 8+. —DELSON	C 64/128. Joystick(s).	90-day warranty. \$12.50 thereafter or for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★	
THE MOVIE MONSTER GAME Epyx, Inc. (see above for address and phone) \$40 ©1986	Imagine yourself in Godzilla's shoes, or those of five other famous monsters. Then choose a city and a plot, and wreak havoc in this inspired action game.† —ADDAMS	Reviewed on C 64/128. Also for Apple, IBM PC/PCjr.* Joystick.	90-day warranty. \$5 thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★	
THE PAWN Firebird Licensees Inc. P.O. Box 49 Ramsey, NJ 07446 (201) 444-5700 \$40 ©1986	You must escape from the magical land of Kerovnia, but not before you've slain a dragon, faced an evil wizard, and rescued a princess. Though it sounds cliched, the treatment is original and entertaining. —ADDAMS	Reviewed on C 64/128. Also for Amiga, 64K Apple, Atari ST, IBM PC/PCjr.* Macintosh.	90-day warranty.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★	
ROBOT RASCALS Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$40-\$45 ©1986	This hybrid of board game and computer program leads you on a robot scavenger hunt on another planet. Best played by 4 gamers; at least 2 are needed. Exciting and funny.† —DELSON	Reviewed on C 64/128. Also for 64K Apple. Joystick.	90-day warranty. \$7.50 thereafter or for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★ ★ ★	
WARGAME CONSTRUCTION SET Strategic Simulations Inc. (see above for address and phone) \$30 ©1986	Offers a variety of historical and fantasy war games, or design your own. Historical periods lack credibility, suggesting need for further development. —DELSON	Atari. Joystick.	30-day warranty. \$10 thereafter.	★ ★	★ ★	★ ★	★ ★	D	★ ★	
RATINGS KEY O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart *Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.										

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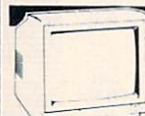
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SOFTWARE REVIEWS

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EDUCATION/ FUN LEARNING

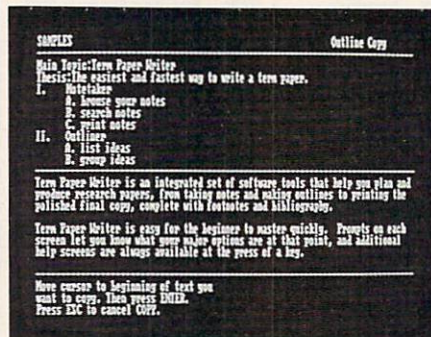
Term Paper Writer

HARDWARE REQUIREMENTS: 128K Apple IIe/IIc, C 128, 256K IBM PC/PCjr.

PUBLISHER: Personal Choice/Activation

PRICE: \$60

PUBLISHER'S SUGGESTED AGES: 14 +



When I was a student, I found that being organized is the master key to writing effective term papers. But it took several years until I understood what I needed to do.

It would have taken less time if I had *Term Paper Writer*, a new program that helps young scholars organize their work. It adds a layer of structure so that students don't get lost or confused as they work with notecards, bibliography cards, outlines, and drafts.

When my daughter, Debbie, did a literary research paper recently, she used this program to start off. With *Notetaker*, the first of four sections, she typed out all her bibliographic information. She then was able to edit both note and source cards, add key words, arrange them, and print them out. The only drawback was that in some cases, work became repetitious as she typed in notes she had already handwritten.

With *Outliner*, Debbie listed and grouped her basic ideas, and used this list to create a working outline. She typed her main topic and thesis sentence, created headings, sub-heads, and details, inserted and deleted ideas, and moved them around.

She used both her notes and outline in the *Writer* (the package's fair-

ly good word processor) when she was ready to compose the first draft. Writers are limited to 20 printed pages, but she needed only nine.

The final, no-longer-dreaded step was setting up footnotes and a bibliography. *Term Paper Writer* automatically created Debbie's bibliography in her choice of style and inserted footnotes.

If, like myself or my daughter, you've ever lost a note card, can't find the source for a quote, or can't fathom bibliographical form, *Term Paper Writer* is for you. If you've ever understood your topic when you began but ended up confused by notecards and the reams of paper you've generated, *Term Paper Writer* is for you. This new program lets you work on the ideas and rely on the computer to help you get them organized.

—GWEN SOLOMON

HOME BUSINESS & PRODUCTIVITY

Instant Music

HARDWARE REQUIREMENTS: 512K

Amiga.

PUBLISHER: Electronic Arts

PRICE: \$50

One afternoon a week or so ago, I was greeted at the door by what sounded like the Ewok Chorus from *Return of the Jedi*. The sound was coming from the computer, not the stereo. "What are you guys doing up there?" I demanded from my children. "It's that new program," they explained.

Instant Music—that new program—combines the Amiga's sound and graphics capabilities to come up with music you paint rather than write. Notes are represented on the screen by colored blocks. If you want the sound to go up, you move the line of blocks up. Although only four voices will sound at a time, you can select those four from a list of 19 different instruments. It was the "Do Voice" instrument that had made our computer sound like Ewoks.

Timid musicians don't need to stare at a blank screen and wonder where to put the notes. You can start by loading one of over 40 tunes and play along using the mouse. Some of the tunes are simply common rock or jazz background rhythms and harmonies, so you can improvise all you want with the computer for backup. There's also a file drawer that contains 22 rock and

jazz chord progressions you can place into your own tunes once you're comfortable.

The software is like a musical word processor: It lets you edit your masterpieces in several ways. You can duplicate sections of the piece, move notes from one instrument to another, and paste in clips from other tunes. If you have *DeluxeVideo*, an animation program from the same company, you can use your *Instant Music* creations as background for your music videos.

We expect Amiga programs to be easy to use, and we weren't disappointed. When *Instant Music* inadvertently became a major attraction at our daughter Cherry's 12th birthday party, guests who had never used the Amiga before were composing music within minutes. This is a great choice for families who like music.

—TAN A. SUMMERS

PFS: First Choice

HARDWARE REQUIREMENTS: 256K IBM PC.

PUBLISHER: Software Publishing Corp.

PRICE: \$179

Although this new program is being marketed especially for beginners, it is probable that *First Choice* will in fact be many people's last choice, too.

Each module in the integrated package—word processor, file manager, spreadsheet, and communications software—is powerful enough to meet the needs of the average family user or a small business. With the beginner in mind, *First Choice* relies primarily on simple pull-down menus, although there is a limited set of "speed key" commands for the more experienced user (noted on a separate command card to jog your memory). A one-hour "quick tour" of the software provides a nice introduction to most of the features and goes far to reduce beginners' nerves. The written documentation is a model of clarity; step-by-step instructions assume absolutely no prior knowledge.

The parts of the package work well, both separately and together. As a result, it is possible to transfer from one function to another without changing disks, and information from one part can be used by another. For instance, the word processor's spelling checker and search-and-replace routines can also be

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SOFTWARE REVIEWS

used with records from the data base. Phone numbers contained in files can be used to dial a modem when in communications mode. And spreadsheets or data-base reports can be inserted easily into word-processor documents.

Some drawbacks to be aware of: Very little use has been made of command keys, so you will have to rely heavily on menus. If data-base records are to be sorted by date, it is necessary to enter your dates in a format that even the publisher calls "funny": year/month/day. Thus, April Fool's Day this year must be entered as 87/04/01! Different type styles all appear as boldface on-screen; you can't immediately tell whether some text is actually boldfaced, italicized, or underlined. But for many users, these are likely to be acceptable limitations on what is otherwise a superb introduction to computer productivity.

—TONY MORRIS

MoneyMate

HARDWARE REQUIREMENTS: 256K IBM PC.

PUBLISHER: RealWorld Corp.

PRICE: \$169

My first impressions of this package were skeptical at best. My editor handed me the biggest software box I've ever seen—a foot across and nearly two feet long—filled with two diskettes, a bunch of office supplies, and a fat users' guide. There were two rubber stamps labeled ENTERED and PAID, six manila folders with preprinted labels, a cute plastic rack to hold them, some plastic paper clips, a highlighter pen, and a little blank notebook for cash activities. A trifle gimmicky perhaps? The company's name is RealWorld Corporation, and the first page of the manual quotes L. Ron Hubbard extensively, telling me where I can write for more information about the "educational discoveries" of the founder of Scientology.

Between the Toys 'R Us-style packaging and my philosophical differences with Mr. Hubbard, I booted the disk with a chip on my shoulder.

That chip fell off fast. The designers of this software lived up to the company name: They looked at the real-world financial requirements of regular folks, and produced an extraordinarily sensible and sophisticated money-management tool.

Included are all the basic functions of home-bookkeeping software, such as bank account balancing, op-

tional computer check printing, and budgeting with comparison of actual and planned expenditures. This is the first time, though, that I've worked with a personal-finance package that specifically deals with unpaid bills as they arrive. You can enter the bills and their payment due dates, then produce complete reports describing your cash flow requirements.

The program comes with 100 prepared budget categories and allows for a total of 200. The treatment of tax information is noteworthy. Instead of just indicating whether an item is tax-related or not, as is common with other home-finance packages, *MoneyMate* provides specific breakdowns based on sections of the tax form, and sorts the information appropriately when you print out a tax report.

The entire program is menu-driven, with available function keys specified at the bottom of each individual screen. For example, F10 is the key for context-sensitive help screens. That fat users' guide, which looked so daunting at first, turns out to include excellent step-by-step instructions for setting up your accounts, plus a well organized reference section, a good glossary, and a complete index—all written in clear, comprehensible English.

If your financial affairs include substantial investment transactions, *MoneyMate* is fairly limited, a fact freely admitted in the documentation. For the rest of us, though, the program provides a comprehensive system for organizing and controlling personal finances. Not only that, it's easy to find. Just look for the biggest box on your software store's shelf.

—STEVE MORGENSTERN

Thinking Cap

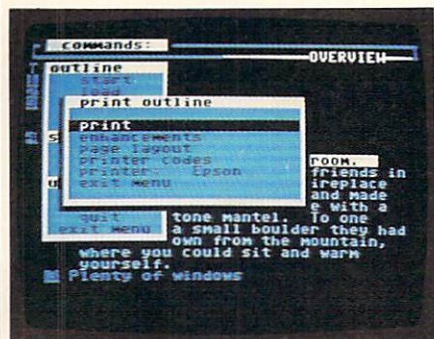
HARDWARE REQUIREMENTS: C 64/128.

PUBLISHER: Broderbund Software

PRICE: \$50

Creative people have ideas. Productive people are creative people who go one step further, organizing their ideas and then doing something about them. Whether you organize your ideas in classic outline form, jot down lists, or leave memos for yourself and others, you can enhance your productivity with *Thinking Cap*, which the publisher calls "The Outline Processor."

Thinking Cap lets you type in ideas as they occur during a brain-



storming session, then rearrange them for optimal follow-up. As thoughts begin to take shape, you can group them using up to seven levels of subheadings. It's easy to switch between headings and details using the cursor keys. With room for about eight lines of text at each level, outlines can contain as much information as the computer's memory will allow, about six-to-eight pages.

Once you've put your flood of ideas into the computer, you can begin to refine them. *Thinking Cap* provides complete editing capabilities so that you can rearrange topics, insert new thoughts, or clarify old ones. You can also shift an item from one level to another using the cursor keys. Topics can be merged or split into more manageable segments. When moving parts of the outline, you can indicate whether you want to relocate an entire section, including all subtopics and details that belong to it, or just that topic alone.

You can examine an idea more closely in overview mode, or temporarily hide all the details to simplify the picture. When you're finished, *Thinking Cap* prints your outline, automatically formatting it in the style you select. Choices include the traditional Roman form (e.g., I, A., 1.), the technical style (e.g., 1.1, 1.2, 2.1), or a straight text format with either hanging or paragraph indentation.

As one of the best productivity tools we've seen for the C 64/128, we recommend *Thinking Cap* to thinkers everywhere. —TAN A. SUMMERS

ENTERTAINMENT

Airheart

HARDWARE REQUIREMENTS: 128K Apple IIe/IIc.

PUBLISHER: Broderbund Software
PRICE: \$35

REVIEWER'S SUGGESTED AGES: 9+

It may sound like an adventure

game, this quest for the Sword of Strength, the Goblet of Generosity, and the Harp of Harmony. But *Airheart* is really a scintillating shoot-'em-up whose long-range goal is to awaken a Prince from suspended animation so he can assume his father's throne. This feat entails scooting across the ocean in a jet-powered sled and defeating an assortment of aquatic robots.

Portrayed with double high-res graphics and convincing 3-D effects, *Airheart* shows your jet-sled perched in midscreen as you control it with the joystick. You can dive beneath the waves, spin in tight or wide circles, or shoot straight up and disappear off the top of the screen. The action all occurs on the ocean, where you chase a "glimmer" of light to the Treasury. Each of seven kinds of robot guardians fights with a unique style; for instance, the Sucker's deadly vacuum traps the sled, the Whomper smashes it head-on, and the Spitter shoots exploding bullets.



When you destroy a robot, a tiny piece of it zips away and turns into a fresh foe, unless you catch up and snare it with your sled. So in addition to developing specific tactics for the various robots, you'll spend half the game in high-speed chase scenes. This gets complicated when you're fighting several robots at once, or when you've got to dodge and shoot at one robot while chasing the fragment of another.

After eliminating the robots and obtaining the Sword, you may earn an extra jet-sled. Subsequent missions ask you to retrieve the Goblet and the Harp. Then you're ready for the final battle—against all seven robot types—after which you may awaken the Prince and earn the coveted title of *Airheart*. Sound effects are minimal, but the animation sparkles. *Airheart* exhibits originality in both design and execution. The sensation of whirling the jet-sled in

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SOFTWARE REVIEWS

circles over a sparkling ocean was a new thrill for this jaded joystick jockey.

—SHAY ADDAMS

The Movie Monster Game

HARDWARE REQUIREMENTS: C 64/128.

PUBLISHER: Epyx

PRICE: \$40

REVIEWER'S SUGGESTED AGES: 7+

Let's do lunch. How about some laser-fried New Yorkers, with a few meeringue-covered Parisians for dessert? No, you won't have to turn cannibal, for this game casts you as Godzilla or one of five other monsters. All are inspired by cinematic creatures, and each has its strengths and weak-



nesses. For example, the Glog resembles the Blob, Tarantus is a spitting image of the giant spider Tarantula, and Sphectra is a Mothra spin-off.

You can romp and stomp in New York, Paris, Tokyo, or one of three other cities. What's the plot? That too is up to you: Destroy Landmark, Escape, Lunch (on people and vehicles), Search (for your baby monster), or just plain go Berserk.

Then the fun begins, as your monster appears in the street, towering over the cars and cabs and those pesky little people. All action is joystick-controlled, and the picture scrolls as you reach its edges. My favorite scenario is Lunch, in which you score points by satisfying your hunger. But knocking down landmarks like the Plaza Hotel is fun, too, and so are the rest.

It's not all cake and cabbies, however, for tanks, soldiers, helicopters, and jets are shooting at you—just like in the movies. Points are awarded according to the plot, and it ends in a few minutes after you've accomplished your goal or been killed. With so many monsters, cities, and plots, *Movie Monster* has higher than average replay value. The animation and sound effects are well-handled, and I haven't had such a good time with an action game in ages.

—SHAY ADDAMS

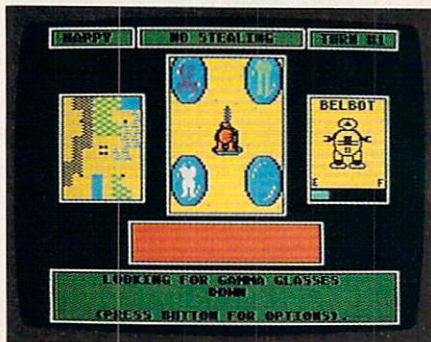
Robot Rascals

HARDWARE REQUIREMENTS: 64K Apple, C 64/128.

PUBLISHER: Electronic Arts

PRICE: \$40-\$45

REVIEWER'S SUGGESTED AGES: 8+



Life isn't so bad for a scavenger robot on this little alien planet. You get to roam the hills and forests, plains and swamps, looking for valuable objects. You can teleport from place to place with all the speed of a *Star Trek* "beam-up." And if your owner is smart, you can even have your built-in abilities improved with the aid of special devices. Okay, the hours may be long, but if you win the hunt, you can dance right off the screen and celebrate.

Robots and humans alike have cause for celebration with the release of *Robot Rascals*. This new hybrid of board game and computer program is a scavenger hunt on another planet in which two to four players each control a cute but idiosyncratic little robot (chosen from a gaggle of 10 possible "roll models").

At the game's start, each player is dealt a few cards. Your goal is to have your robot search the planetary surface, locate the objects shown on your cards, and bring them "home." The fun comes as players steal objects from each other, use other types of cards to alter the course of play, find their valuable assets turned to counterproductive objects by the computer, and even have robots break down at crucial moments.

Fast-moving and easy-to-learn, *Robot Rascals* is exciting and funny at the same time. Our playtesting suggested that it's best played by four, although two-person games were fun when extra options were added (including some designed by the players between matches).

This excellent game is a natural for players of differing ability and experience levels, as it has a fine built-in handicapping system. It's a winner.

—JAMES DELSON

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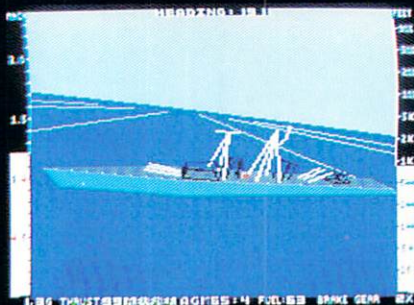
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